



The Chartered
Institute of
Management
Accountants®

OPERATIONAL CASE STUDY May 2018 EXAM ANSWERS

Variant 3

The May 2018 exam can be viewed at

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SECTION 1 -Linear programming graph

Explanation of the graph and the optimum production plan

The linear programming graph shows the current situation in terms of available resources and demand for the two product ranges. Demand X is demand for our handbag range and Demand Y is demand for our range of women's accessories.

We can determine the feasible region, which is the area within which all the possible combinations of output are contained, from the graph. We can see that the feasible region is the area bounded by the demand for X line, the demand for Y line and the labour hour constraint line. The ISO-contribution line represents the contribution that can be earned from all the possible combinations of X and Y. If this line is moved as far to the right as possible whilst still remaining within the feasible region it will indicate the maximum contribution that can be earned. The furthest point within this area is the point where the demand for X and the labour hour constraint intersect. This is the point that will maximise contribution. The production plan can be read from the graph as 170,000 units of X (the handbag range) and approximately 43,000 units of Y (the accessories range).

Appropriateness of the optimum production plan

The optimum production plan given by the graph is from a financial perspective based on the information given, however it may not be the most appropriate solution. The graph is based on estimated figures for demand for each product range, which is uncertain. Reducing the level of production of our range of accessories by almost 50% may not be a good decision and may have implications for the longer term if we lose customer loyalty.

Amount to pay for further resources

In order to meet maximum demand, we may decide that the best option is to purchase further resources. Machine hours are not a binding constraint therefore the shadow price (that is, i.e. the contribution earned from one additional machine hour) is zero. At present, we have a shortage of labour hours and this is a binding constraint. The 'shadow price' of labour hours is the contribution that would be earned from one additional labour hour. The maximum price we should pay for an additional labour hour is the shadow price plus the standard cost of a labour hour. The purchase of additional labour hours will have the effect of moving the constraint line to the right until labour hours are no longer a binding constraint and the shadow price is zero. At this point, machine hours will become a binding constraint.

Other options

The staff employed in our factories are skilled in the manufacture of leather goods. In the medium term, we can overcome the shortage of labour hours by hiring and training new staff. In the shorter-term however we need to look at other options.

Another potential option is to outsource the production to an external supplier. Depending on the price and other contractual arrangements offered by the supplier this may be a viable option.

Sales forecasting

Estimating our demand for the new range of men's accessories is difficult since this is a new venture for us and whilst we have significant past experience of selling ladies accessories, this is not necessarily going to provide a good indication of demand for our new range of men's accessories.

It would therefore be useful to have available as much additional information as possible which can be obtained using a variety of different methods both non-statistical and statistical.

Non-statistical methods

We could canvas the opinion of experts in the market to gain their view on the likely demand for the men's accessories in future periods. This can be very subjective however and experts may have a range of different opinions.

We could undertake market research to canvas the opinion of the end consumers on our new range of products. Given that this is a completely new market and we do not have any knowledge of it, the best option is likely to be to engage a market research consultant. The consultant could conduct surveys and report back to us on the scope of the market for the new range of products. The cost of using the consultant is likely to be outweighed by the benefits of the consultant's expert knowledge. The end result is likely to be more useful and accurate than if we did it ourselves.

Any survey undertaken would need to be targeted to our likely end consumers. Possibly we could arrange with the expert consultant to have market researchers in stores to survey our existing customers who may potentially buy the men's accessories for partners, husbands and sons.

From the survey information, the consultant would be able to use their knowledge of the market to predict sales levels.

Statistical methods

We could determine whether statistical information, on the market for men's luxury accessories, was available from external market research organisations. It may be necessary to pay for the required information but the potential benefit from this knowledge of the market is likely to outweigh the costs.

From this data, we could use time series analysis to determine whether there is any underlying historical trend and, if there is, use this to forecast the trend into the future. We can also identify whether there are any seasonal variations around the trend and, if there is, we can measure the seasonal variations and apply these to a trend line forecast in order to forecast season by season demand. The sale of men's luxury accessories will likely be affected by seasonal variations since, for example, we would expect to sell more products during the Christmas season.

This will give us information about the whole market for men's accessories. We would then need to make a judgement about our potential share of that market to determine our sales revenue.

SECTION 2 – Make or Buy decision

A make or buy (or outsourcing) decision is a decision made by management on whether to make our products internally or buy them from the market. From a financial perspective, the relevant costs of the decision are the incremental costs resulting from making or buying the products. The incremental costs of buying in the products will be the purchase price from the supplier. The incremental costs of making the products will normally be the variable costs of production on the assumption that our fixed costs will remain unchanged whether the products are manufactured internally or purchased externally.

Determining products to make or buy

At first glance, it would seem that we should offer the full production of accessories to the supplier since the prices offered are all below our total production costs per unit. However, on the assumption that our fixed production overheads will remain the same whether we make or buy, we should compare the price offered to our variable production cost per unit. Table 3 shows the excess purchase cost of buying compared to the variable cost of making. On this basis, all of the price offered by the supplier are higher than our variable costs per unit. We could make the decision based on the difference between the purchase price and the variable cost per unit and manufacture in-house the products with the largest difference in order to minimise the excess costs of buying-in. On this basis, we would prioritise, for making in-house, purses and then technology, organisers and lastly pouches. However, this would fail to recognise that labour hours are a scarce resource. We should therefore look at the additional cost per labour hour and manufacture in house the products with the largest difference per labour hour. This would enable us to minimise the excess cost per unit of the scarce resource and therefore make the best use of our scarce resource. On this basis, we would prioritise, for making in-house, technology and then purses, pouches and lastly organisers until we have used the available labour hours.

Other factors

Before making a final decision however, there are other factors that we should consider:

- Would the supplier be able to supply the products to the quality standards that we require? This is extremely important to us as our reputation relies on the quality of the products.
- How reliable is the supplier? Would the supplier be able to produce the products on time? The fact that the supplier is based overseas may also result in extended delivery times. Failure to meet delivery times would result in lost sales for our company.
- Does the supplier share the same ethos as us in terms of corporate and social responsibility and environmental management? As part of our corporate and social responsibility, we require any supplier to adhere to our supplier's code of conduct. To be linked with a company which fails to meet high standards in these areas would be detrimental to our business.
- How financially stable is the supplier? If the supplier failed, this would result in lost sales whilst we find a new supplier.

- Does the purchase price include delivery costs? As the supplier is based overseas these could be considerable.
- Is it a good idea to use a supplier which is based overseas? Our brand has been based on a “Made in Lowerland” badge of quality and customer may feel deceived if they discover that some of the products are made overseas. It would be unethical of us if we did not make it clear to customers where the products have been produced.
- Using an overseas supplier would also potentially expose us to currency fluctuations depending on the currency used in the purchase agreement.

Investment of surplus cash

Determining the amount of surplus cash available to invest

We firstly need to determine exactly how much cash is surplus to our short-term requirements. This can be achieved by preparing a detailed cash forecast which takes into account all receipts and payments. This needs to include all potential payments, including any interest, loan repayments or dividend payment. As the expansion of the production facility is to start immediately, we should also consider whether there are any up-front payments required and the timing of any stage payments for the development.

Once we have established our surplus cash, we will need to decide whether we require a buffer of cash available for any unforeseen circumstances that might arise. To avoid the risk of running out of cash it would be appropriate to retain a buffer.

Factors to consider when investing surplus cash

Once we have determined the amount of cash that is surplus, the other factors that need to be considered can be categorised into three main areas: profitability, liquidity and safety.

Profitability relates to the return to be gained from the investment. Clearly there is a need to earn as high a return as possible, however a high return usually correlates with high risk in an investment. Thus, it is important that any considerations regarding return are balanced with considerations about the risk of the investment. The risk of the investment is linked to both its liquidity and particularly to its safety.

Liquidity relates to how easily the investment can be converted into cash. Usually the easier it is to convert the lower the level of return. From our perspective, as long as we are confident that this is surplus cash, then we could invest the funds until they are required for investment in the expansion of the production facility.

Safety relates to how secure the investment is. Usually the safer the investment, the lower its return. Clearly there is a need to protect the capital value of our investment as we will need the funds for the expansion of the production facility.

Suggestions of suitable investments

Bank deposit account:

The surplus funds could be invested in an interest-bearing bank deposit account for a period. This is likely to be a safe investment since even if the bank were to find themselves in difficulty, there would likely be government backing in some form with deposits protected, although we would need to check this. The return is likely to be low on this type of investment.

Money market deposits:

With the help of our bank, the funds could be placed on money market deposit. This is likely to give a higher rate of return than a normal deposit account. This is however only available for very large sums of money.

Marketable securities:

We could invest in short term bonds or gilts on the money market. These types of investment are riskier than deposits, especially if the bonds are corporate, however they usually offer the opportunity of a greater return. One way to reduce the risk would be to invest in government bonds such as Treasury Bills. Because these are government backed the risk is negligible, although as a result the return will be lower.

SECTION 3 –Digital marketing

Digital marketing is the promotion of brands using electronic media, such as email, the internet, mobile phones or social media. Compared to non-digital methods, digital marketing has the benefit of being able to monitor and evaluate the marketing in a timely and cost-effective way (for instance by monitoring what is being viewed on an internet page).

The type of information that we may wish to disseminate through digital marketing would include corporate developments, specific product developments, special offers, competitive performance, and independent reviews. In this case, we would want to disseminate details of our new range of men's accessories.

Internet:

Our website should promote the new men's accessories range so that any visitors to the website will be aware of the new range. It will also allow us to deliver a good quality, up to date message. Our other marketing can direct customers to our website, with specific parts of the website dedicated to different ranges and different types of customers. The company website needs to be up-to date, well designed and easy to navigate. Since this will be accessed by a range of different types of customers, they all need to be directed quickly and easily to those pages that are of particular interest to them.

Email:

E-mail can provide sophisticated segmentation opportunities so that messages and details of any future promotions can be sent via email to specific segments of our market. This will help to develop a more intimate customer relationship. For instance, we would want to capture email addresses of our current customer base and send them regular updates of our product range to encourage repeat purchases. Our current customer base is probably mainly women however they would also be an important potential market for our new men's accessories range, as they are likely to buy gifts for their partners, husbands and sons.

It is important to distinguish our e-mails from the frequent junk mail that consumers will undoubtedly receive. E-mails should be sufficiently significant and interesting to encourage the consumer to read them.

Social Media Marketing

Social media sites such as Facebook and Twitter have a large number of users. Firms mainly using B2C (business to consumer) models, such as ourselves, use these sites for marketing purposes and market research. It is useful to monitor brand names that are mentioned on these sites to capture any reviews of our products or of our competitor products. Consumers are using social media to raise the profile of customer complaints and the message can reach a large number of people very quickly, so knowing about this and giving an appropriate response is very important.

Mobile Phone App

Our market research suggests that a significant percentage of on-line customers are placing their order using mobile phones. It is therefore important that our mobile phone app is appealing to consumers and easily navigated. The app will be in a different format to our internet site but can also be used to deliver our marketing message to customers.

Marketing packages

Explanation of the figures

The expected value has been calculated for each package and represents the weighted average of all the possible outcomes weighted by their probability.

The standard deviation for each package is a measure of the variations of the outcomes from the expected value and is therefore an indication of risk. The coefficient of variation for each package is its standard deviation divided by its expected value. The co-efficient of variation allows the risk of each package to be compared.

Expected value

If we were to make the decision based on expected value, we would choose Package C however the use of expected value has a number of limitations. Expected value gives no indication of the range of possible outcomes and therefore gives no indication of risk. The expected value is the long run average outcome if the same event was repeated over and over again. Therefore, using expected values in 'one off decisions' such as this decision is inappropriate as it is simply a weighted average. It should also be borne in mind that the probabilities used in the calculation of the expected value of each of the three packages might be very subjective despite the involvement of the market research company.

Consideration of risk and risk attitude

Whilst Package C has the highest expected value it also has the highest standard deviation. This means that Package C has the widest range of possible outcomes. On the other hand, Package A has the lowest expected value but it also has the lowest standard deviation which means that the possible outcomes have a narrower range around the expected value.

Before deciding which package to choose we need to consider our attitude to risk.

If we were to take a risk seeking approach to the decision, we would be interested in the highest possible outcome, no matter how small the likelihood that that it would occur. Without the details of the possible outcomes for each package it is impossible to tell which package has the highest possible outcome.

A risk neutral decision maker would consider all possible outcomes and would select the strategy that maximises the expected value or benefit. A risk neutral decision maker would select Package C. This type of decision maker would ignore both standard deviation and coefficient of variation.

A risk averse decision maker would choose the campaign which, given the same level of return, has the lowest level of risk. Such a decision maker would choose the package with the lowest coefficient of variation because this is a measure of risk for each L\$1 of expected return. A risk averse decision maker would therefore choose Package A.

SECTION 4 - Variance Analysis

Material mix variance:

A material mix variance arises when the mix of materials used differs from the pre-determined mix included in the calculation of the standard cost of the product. If the mix is varied so that a larger than standard proportion of more expensive material is used, there will be an adverse variance.

This variance has arisen as it was decided to use the more expensive grade of leather to manufacture the front and back of the briefcases. Since a higher proportion of the higher quality leather was used than standard, this would result in an adverse variance.

Material yield variance:

A material yield variance arises because there is a difference between the standard output for a given level of input and the actual output attained. An adverse yield variance may arise from a failure to follow standard procedures or normally from the use of inferior quality materials.

The production manager has advised that the use of the finest quality leather has resulted in a higher level of wastage due to difficulties experienced in machining the individual parts together hence resulting in an adverse yield variance.

In some cases, there may be a trade-off between the material mix variance and the material yield variance. For example, the use of a higher proportion of more expensive material may result in an adverse material mix variance but may improve the yield. However, in this case the leather used, whilst more expensive, has been difficult to work with, which has resulted in an adverse yield variance.

Labour mix variance:

A labour mix variance arises when the mix of labour used differs from the pre-determined mix included in the calculation of the standard cost of the product. If the mix is varied so that a larger than standard proportion of higher paid labour is used, there will be an adverse variance as in this case.

The adverse labour mix variance has arisen due to the need to use more of the highly skilled labour to cut the leather than had been planned. Also, it was necessary to transfer more of the highly skilled labour to the machining of the briefcases.

Labour yield variance:

A labour yield variance arises because there is a difference between the standard output for a given level of input and the actual output attained. An adverse yield variance may arise from a failure to follow standard procedures or normally from the use of lower skilled labour.

Similar to the material mix variance, there may be a trade-off between the labour mix variance and the labour yield variance. For example, the use of a higher proportion of more highly skilled labour may result in an adverse labour mix variance but may improve the yield. However, in this case, whilst we have used more skilled labour, the problems with the material has resulted in a higher than average downtime on the machinery and consequently higher than average idle time which has resulted in an adverse labour yield variance. Also, the need to hand cut the leather will have resulted in more labour hours being required than originally anticipated if the leather was machine cut.

Government Grant

Types of grant

IAS20 refers to two main types of government grants: grants related to assets (or capital grants) and grants related to income (or revenue grants). Grants related to assets are to be used to purchase, construct or otherwise acquire long-term assets. Grants related to income are government grants other than those related to assets.

The part of the grant (L\$200,000) which relates to the purchase of machinery would be treated as a capital grant. The remaining L\$100,000 which relates to the hiring of new staff, would be treated as a revenue grant.

Recognition in the financial statements

The recognition of the grant will depend upon the circumstances.

- If the grant is paid when evidence is produced that certain expenditure has been incurred, the grant should be matched with that expenditure
- If the grant is paid on a different basis, for example, achievement of a non-financial objective, such as the creation of a specified number of new jobs, the grant should be matched with the identifiable costs of achieving that objective.

The grant should only be recognised when there is reasonable assurance that:

- The entity will comply with the conditions of the grant and
- The entity will receive the grant

Treatment in the financial statements

The capital grant portion will be included in the statement of financial position at the full amount of L\$200,000 and released to profit or loss to match the profit generated by the asset. IAS 20 allows two alternative treatments to be adopted in the financial statements:

The first is to credit plant and equipment with the grant, in effect reducing the cost of the asset in the financial statements and reducing future depreciation charges. The second is to treat the grant as deferred income within liabilities and release an element each year to profit at the same rate at which the asset to which it relates is being depreciated. The remainder of the grant will be held as deferred income until it is recognised in the statement of profit or loss. Both of these methods will have the same effect on profit.

IAS20 allows revenue grants to either:

- be presented as a credit in the statement of profit or loss, or
- deducted from the related expense.

Therefore, a credit of L\$100,000 will be shown in the statement of profit or loss or alternatively deducted from the costs of employing new staff. The grant should only be recognised in the statement of profit or loss as the conditions of the grant are being complied with. If there are condition to the grant that requires us, for example, to keep people employed for the next three years, it should be recognised over the three-year period. The remainder of the grant will be held as deferred income until it is recognised in the statement of profit or loss.