

CA FINAL

**PAPER 5
SCM PE
CASE STUDIES**

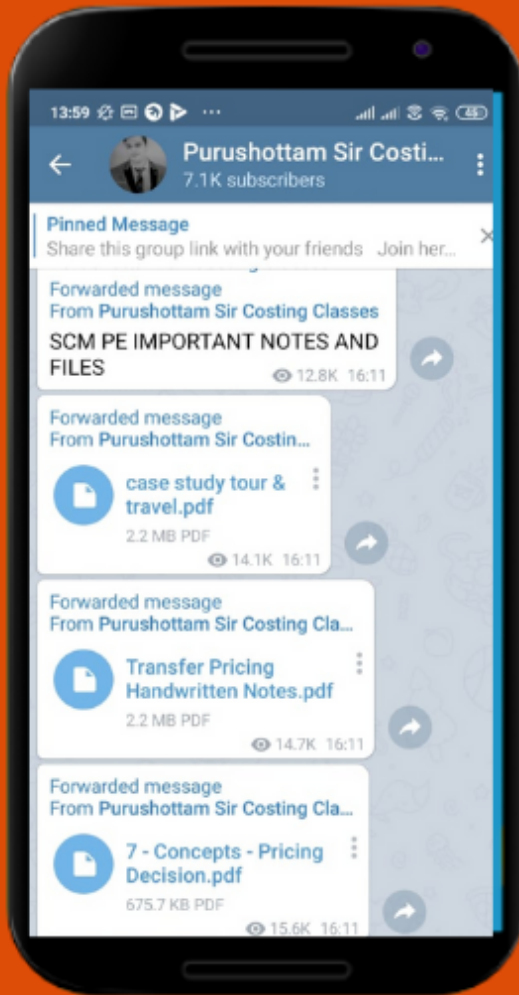
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ACCA



**Case Study of ACCA Relevant for
CA FINAL SCM PE**

By CA Purushottam Aggarwal Sir



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Compilation of ACCA Questions & Answers

CA Final - SCM & PE

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Professional Level – Options Module

Advanced Performance Management

September/December 2015



Time allowed

Reading and planning: 15 minutes

Writing: 3 hours

This question paper is divided into two sections:

Section A – This ONE question is compulsory and MUST be attempted

Section B – TWO questions ONLY to be attempted

Present Value and Annuity Tables are on pages 12 and 13.

Do NOT open this question paper until instructed by the supervisor.

During reading and planning time only the question paper may be annotated. You must NOT write in your answer booklet until instructed by the supervisor.

This question paper must not be removed from the examination hall.

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Think Ahead



The Association of
Chartered Certified
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Question 1

Iron Chicken (IC) is a multinational business which manufactures commercial building control systems. Building control systems include heating and air-conditioning systems, lighting controls, power and water monitoring and security systems (e.g. keypad access, alarms and CCTV). IC's manufacturing takes place at a number of factory sites where some products have a long product life and are simple and mass-produced while other products are complex and have a short product life due to changing technologies. IC's mission statement is 'to create value for shareholders through control products which improve productivity, save energy and increase comfort and safety'.

A new chief executive officer (CEO) has been appointed to address a decline in IC's share price in the last three years. This CEO has identified that the business has grown through acquisition and as a result she stated, 'senior management have focused on making corporate deals and not making control systems.' The CEO has declared that the business must focus on optimising its value generation rather than just getting larger through acquisitions.

You are a performance management expert within IC. The CEO has tasked you with aiding her in aspects of her improvement programme. First, she wants your views on the use of EVA™ as the key performance metric at IC. You have been supplied with the current EVA™ calculation (Appendix 1) but there is some doubt about whether the junior management accountant who has done this work was sufficiently trained in the method. So, the CEO needs you to evaluate its accuracy and the assumptions which form part of the calculation.

Second, the CEO believes that the poor performance of the company can be addressed by ensuring that the mission statement flows down into the performance management of the business. To that end, the following critical success factors (CSFs) have been identified and the CEO wants you to suggest additional key performance indicators (KPIs) for these.

CSF	Associated current KPI
1. Greater staff productivity	Units produced per labour hour
2. Reduction of wastage in production	Power consumed per unit produced
3. Greater innovation of products	Number of new products launched

Your suggestions should be in addition to these current KPIs.

Third, in order to improve performance, the CEO plans to implement initiatives associated with 'lean' manufacturing. Specifically, there are three projects which have been suggested and the CEO needs your advice on these:

1. Move to just-in-time manufacturing
2. Use kaizen costing
3. Examine the costs of quality in achieving a 'zero defects' approach to manufacturing

The CEO has stated, 'I need to know briefly how the improvement projects will meet the three CSFs and also how they will impact on the existing three KPIs.'

Finally, the CEO requested, 'You must tell me the implications of the improvement projects for our information systems as I feel that they are not currently suitable for the plan that I have.' The current information systems of the company are based around the functional departments of the business such as manufacturing, marketing, finance and logistics. Each department has developed its own system although all feed into the finance system which is the main one used for strategic decision-making. In order that the department systems can all feed through to the current finance system, these current systems only handle quantitative data. The company is considering the implementation of a new information system. This new system will introduce networking technology in order to bring together all of the departmental systems into a new, single, corporate database.

Required:

Write a report to the CEO of Iron Chicken to:

- Evaluate the accuracy of the EVA™ calculation and the assumptions in Appendix 1. Advise the CEO on your results, providing calculations as needed. (15 marks)**
- For each of the three critical success factors at IC, briefly explain a weakness of the current KPI associated with that CSF and then provide a justified alternative KPI. (6 marks)**

(iii) Explain what the three improvement projects are, how they will help to meet the CSFs at IC and comment on the impact of each project on the existing three KPIs. (15 marks)

(iv) Assess the impact of the proposed, new information system on the three improvement projects. (10 marks)

Professional marks will be awarded for the format, style and structure of the discussion of your answer. (4 marks)

(50 marks)

Appendix 1

Economic value added

Year ended 30 June 2015

	\$m	Note
Operating profit	551.4	
<i>Add back</i>		
Non-cash expenses	15.1	
Marketing capitalised	23.1	5
Operating lease expenses	40.0	
<i>Less</i>		
Tax	134.8	6
Lost tax relief on interest	24.5	7
Net operating profit after tax (NOPAT)	470.3	
Capital employed		
From the statement of financial position	2,401.0	10
Marketing spend capitalised	23.1	5
Operating leases	115.0	8
Adjusted capital employed	2,539.1	

$$WACC = (1/2 \times 16\%) + (1/2 \times 6.8\%) = 11.4\%$$

$$EVA^{\text{TM}} = \text{NOPAT} - (WACC \times \text{Capital employed}) = 181$$

Assumptions and notes:

- 1 Debt/Equity 100.0%
- 2 Cost of equity 16.0%
- 3 Tax rate 30.0%
- 4 Cost of debt (pre-tax) 6.8%
- 5 There has been \$23.1m of marketing spent each year for the last two years in order to build the brand of IC long term.
- 6 Tax paid in the year was \$130m while the tax charged per the accounts was \$134.8m.
- 7 Interest charged in the period was \$81.6m.
Lost tax relief on this interest was 30% x \$81.6m.
- 8 The operating leases have an average life of four years.
- 9 The only research and development spending identified in the last five years was \$10m expensed during this year on a new product.
The product has not been launched yet.
- 10 Capital employed during the period (from the statement of financial position):

Opening	2,282.0
Change in period	119.0
Closing	2,401.0

Section B – TWO questions ONLY to be attempted

- 2 Perkin manufactures electronic components for export worldwide, from factories in Ceeland, for use in smartphones and hand held gaming devices. These two markets are supplied with similar components by two divisions, Phones Division (P) and Gaming Division (G). Each division has its own selling, purchasing, IT and research and development functions, but separate IT systems. Some manufacturing facilities, however, are shared between the two divisions.

Perkin's corporate objective is to maximise shareholder wealth through innovation and continuous technological improvement in its products. The manufacturers of smartphones and gaming devices, who use Perkin's components, update their products frequently and constantly compete with each other to launch models which are technically superior.

Perkin has a well-established incremental budgeting process. Divisional managers forecast sales volumes and costs months in advance of the budget year. These divisional budgets are then scrutinised by the main board, and revised significantly by them in line with targets they have set for the business. The finalised budgets are often approved after the start of the accounting year. Under pressure to deliver consistent returns to institutional shareholders, the board does not tolerate failure by either division to achieve the planned net profit for the year once the budget is approved. Last year's results were poor compared to the annual budget. Divisional managers, who are appraised on the financial performance of their own division, have complained about the length of time that the budgeting process takes and that the performance of their divisions could have been better but was constrained by the budgets which were set for them.

In P Division, managers had failed to anticipate the high popularity of a new smartphone model incorporating a large screen designed for playing games, and had not made the necessary technical modifications to the division's own components. This was due to the high costs of doing so, which had not been budgeted for. Based on the original sales forecast, P Division had already committed to manufacturing large quantities of the existing version of the component and so had to heavily discount these in order to achieve the planned sales volumes.

A critical material in the manufacture of Perkin's products is silver, which is a commodity which changes materially in price according to worldwide supply and demand. During the year supplies of silver were reduced significantly for a short period of time and G Division paid high prices to ensure continued supply. Managers of G Division were unaware that P Division held large inventories of silver which they had purchased when the price was much lower.

Initially, G Division accurately forecasted demand for its components based on the previous years' sales volumes plus the historic annual growth rate of 5%. However, overall sales volumes were much lower than budgeted. This was due to a fire at the factory of their main customer, which was then closed for part of the year. Reacting to this news, managers at G Division took action to reduce costs, including closing one of the three R&D facilities in the division.

However, when the customer's factory reopened, G Division was unwilling to recruit extra staff to cope with increased demand; nor would P Division re-allocate shared manufacturing facilities to them, in case demand increased for its own products later in the year. As a result, Perkin lost the prestigious preferred supplier status from their main customer who was unhappy with G Division's failure to effectively respond to the additional demand. The customer had been forced to purchase a more expensive, though technically superior, component from an alternative manufacturer.

The institutional shareholders' representative, recently appointed to the board, has asked you as a performance management expert for your advice. 'We need to know whether Perkin's budgeting process is appropriate for the business, and how this contributed to last year's poor performance', she said, 'and more importantly, how do we need to change the process to prevent this happening in the future, such as a move to beyond budgeting.'

Required:

- (a) Evaluate the weaknesses in Perkin's current budgeting system and whether it is suitable for the environment in which Perkin operates. (13 marks)

- (b) Evaluate the impact on Perkin of moving to beyond budgeting. (12 marks)

(25 marks)

- 3 Posie is a large business which manufactures furniture. It is made up of two autonomous divisions in Deeland. The manufacturing division purchases raw materials from external suppliers, and performs all manufacturing and packaging operations. All sales are made through the retail division which has 95 retail stores in Deeland, as well as through Posie's own well-developed website. Posie has retail operations in eight other countries as well as in Deeland. These overseas businesses operate as independent subsidiaries within the Retail Division, each with their own IT and accounting functions.

The furniture is sold in boxes for customers to assemble themselves. About 10% of the products sold by Posie are purchased already packaged from other manufacturers. All deliveries are outsourced through a third party distribution company.

Posie's corporate objective is to maximise shareholder wealth by producing 'attractive, functional furniture at low prices'. This is how customers generally perceive the Posie brand. The CEO of Posie is concerned about increasing levels of returns made by customers and increasing numbers of consumers complaining on online forums about products purchased from Posie.

Concerned about the impact on the Posie brand and the cost-leadership strategy, the CEO has asked you as a performance management expert to help Posie implement the six sigma technique to reduce the number of products returned and in particular to define customers' requirements and measure Posie's existing performance. The production director has been appointed to sponsor the project and you will be supported by a small team of managers who have recently received training in six sigma. The board member responsible for manufacturing quality recently resigned because she thought it was unfair that the manufacturing division was being held responsible for the increased level of customer returns.

You have been given access to some information concerning the reasons why customers return goods to help you measure existing performance in this area (Appendix 1). This is an extract from the management reporting pack presented to the board at their monthly meetings. The returns data, however, are only compiled every six months due to the lengthy analysis required of data from Posie's overseas retail operations. It is included twice a year in the board report along with the KPIs for customer satisfaction. The last time this information was produced 93% of customers indicated they were satisfied with the quality of the manufacture of Posie's products.

The CEO has heard that six sigma requires 'large amounts of facts and data'. He suggested that the returns data contain insufficient detail and that as part of your project you may need to do more analysis, for example, on why customers are not satisfied with the manufacturing quality.

He also added, 'I'm not sure that our current IT systems are capable of generating the data we need to identify which responsibility centres within the manufacturing division are the root causes of the problem of customer returns. We are planning to change the designation of the overseas retail businesses from profit centres to revenue centres, but again we need to know first how this will affect the information requirements of the business and any potential problems with doing so.'

Appendix 1

Reasons given by customers for returning goods

Category	Reason for return of goods	% Responses
1	Difficult to assemble or pieces missing	48%
2	Goods arrived damaged	14%
3	Goods were not as described or were defective	25%
4	Goods were of poor quality or no longer wanted	11%
5	Arrived late	2%
Total		100%

Required:

- (a) Advise the board how the six sigma project at Posie to reduce returns from customers could be implemented using DMAIC methodology. (15 marks)
- (b) Evaluate the impact on Posie's information requirements arising from:
- (i) The need to identify and improve on the level of customer returns. (6 marks)
 - (ii) The proposed re-designation of the overseas subsidiaries from profit centres to revenue centres.

(4 marks)

(25 marks)

- 4 Soup operates passenger rail services in Deeland, a technologically advanced country, with high demand for fast reliable rail travel from business and leisure passengers. Many passengers choose train travel because they see it as less harmful to the environment than other forms of transport.

Soup's main objective is to maximise shareholder wealth. Since becoming licensed to operate routes in Regions A and B by the Deeland government five years ago, Soup has consistently delivered increased dividends and share prices for investors. In its initial appraisal of the licensing opportunity, Soup expected to operate the routes for at least 15 years, however, their licence may not be renewed when it expires in three years' time. The government has warned Soup it 'is unhappy about high returns to shareholders while there are many reports of poor passenger service, overcrowded trains and unreliable services on certain routes and at busy times'.

Soup owns its fleet of diesel powered trains. Each train in Region A has seven coaches with 70 passenger seats available per coach. In the less busy Region B, each train has six coaches each with 70 seats. As a condition of the licence, Soup runs a set number of services at both busy and quieter times in both regions. Soup has two larger rivals, both operating electric trains, which cause less harm to the environment than diesel powered trains. They run on the same routes in both regions.

The government regulates fares charged to passengers, which are the same per distance travelled for every operator in that region. The railway track, stations and other infrastructure are managed by the government which charges the operators a fee. There are several stations along the route which are only used by Soup trains and others where Soup trains do not stop at all.

Soup's trains are 25 years old, originally purchased cheaply from an operator whose licence was withdrawn by the government. Soup believes the low price it paid is a key competitive advantage enabling them to steadily increase their return on capital employed, the company's main performance measure, to a level well in excess of their rivals. The shareholders are pleased with the growth in passenger numbers over the last five years, which is the other performance measure Soup uses.

Soup's ageing trains spend increasing time undergoing preventative maintenance, safety checks or repairs. A recent television documentary also showed apparently poor conditions on board, such as defective heating and washroom facilities and dirty, torn seating. Passengers complained in the programme of difficulties finding a seat, the unreliability of accessing wireless internet services and even that the menu in the on-board cafe had not changed for five years.

Soup's CEO responded that unreliable internet access arose from the rapid growth in passengers expecting to access the internet on trains. She said Soup had never received any formal complaints about the lack of choice in the on-board cafe, nor had she heard of a recent press report that Soup's trains were badly maintained, so causing harm to the environment.

The CEO has asked you, as chief management accountant, for your advice. 'In view of the government's warning, we must develop performance measures balancing the needs of passengers with the requirements of the shareholders', she has said. 'I don't want to know how to improve the actual performance of the business; that is the job of the operational managers, nor do I just want a list of suggested performance measures. Instead I need to know why these performance measures will help to improve the performance of Soup.'

The following data applies to Soup:

	Region A	Region B
Number of services per day		
Peak times	4	4
Other times	6	8
Number of passengers per day		
Peak times	2,500	1,400
Other times	2,450	1,850

Required:

- (a) Advise the CEO on how the use of the balanced scorecard could improve the performance management system of Soup.

(10 marks)

- (b) Using the performance data given, evaluate the comments of the Deeland government that Soups trains are overcrowded. (7 marks)
- (c) Assess the problems Soup may encounter in selecting and interpreting performance measures when applying the balanced scorecard to its performance management system. (8 marks)
- (25 marks)

Answers of Above Question Paper

Professional Level - Options Module, Paper P5
Advanced Performance Management

September/December 2015 Answers

1 Report

To: Board of Iron Chicken (IC)
From: A. Accountant
Date: December 2015
Subject: Performance management issues at IC

Introduction

This report evaluates the accuracy and assumptions used in the calculation of EVA™. It then suggests new KPIs for the current CSFs at IC. Finally it considers the impact of three quality improvement projects on these CSFs and a proposed new information system.

(i) Economic value added (EVA™)

There are a number of errors in the existing calculation of (EVA™). These are described below and then the corrected EVA™ is calculated.

Non-cash expenses are correctly added back to profit as such costs are treated as unacceptable accounting adjustments on a cash-based view. Marketing activities for long-term benefit are correctly added back as they generate future value for the business and so the prior year expenditure is also added in to capital employed. Operating leases should be added back to profit and to capital employed and a suitable additional depreciation charged as these are now treated as assets of the business. Research and development (R&D) expenditure should be treated as for the long-term marketing spending (note that there was no R&D expenditure in the prior year). The tax cost in the calculation should be the amount paid adjusted for lost tax on interest and not the adjusted amount of tax charged in the accounts. The WACC is incorrectly calculated as it should be based on the post-tax cost of debt. The capital employed figure should be based on the year start figure.

Economic value added

Year ended 30 June 2015

	\$m
Operating profit	551.4
<i>Add back</i>	
Non-cash expenses	15.1
Marketing capitalised	23.1
Operating lease expenses	40.0
Research and development	10.0
<i>Less</i>	
Depreciation on leased assets (115/4)	28.8
Tax	130.0
Lost tax relief on interest	24.5
NOPAT	456.3
Capital employed	
At 2015 year start	2,282.0
Marketing spend capitalised from YE 30 June 2014	23.1
Operating leases	115.0

Adjusted capital employed at 2015 year start

2,420.1

$WACC = (1/2 \times 16\%) + (1/2 \times 6.8\% \times (1 - 30\%)) = 10.38\%$

$EVA^{TM} = NOPAT - (WACC \times \text{Capital employed}) = 205$

The recalculated economic value added has increased from \$181m to \$205m which still indicates a positive position for the company as it adds to shareholder wealth.

In addition to the corrections above, the following assumptions in the calculation require comment:

1. There is an implicit assumption that accounting depreciation (included in operating profit) is equivalent to economic depreciation (which should be used for EVATM calculations). This is questionable generally, although there is no information to allow a more accurate calculation. Also, there is additional marketing spending which will probably have a limited economic life in building the brand. No estimation of this life and the resulting additional economic depreciation has been attempted in the above calculation.
2. It has been assumed that no amortisation needs to be charged on the research and development costs since the product has not yet launched. This is in line with the accounting treatment of such items.

(ii) Key performance indicators for the critical success factors

Greater staff productivity

The current measure of units produced per labour hour does not reflect the skill and effort which goes into producing different units. The products of IC range from complex to simple and so revenue per employee would better reflect the different skill levels involved in production.

Reduction of wastage

The weakness of the existing measure is that it only looks at one cost area of production (power consumption). Stock obsolescence will measure the wastage due to technological change which is present in the complex products produced by IC.

Greater innovation of products

The number of patents filed will reflect greater innovation at IC. Patents will legally protect groups of products. This will represent a stronger measure of innovation than new products launched since the patent gives legal exclusivity.

[Tutor note: There are many possible acceptable answers to this question, e.g.

Greater staff productivity

Actual staff hours as a percentage of standard hours for actual production as this would measure staff efficiency in producing a wide range of products.

Reduction of wastage

Input/output analysis of material which looks at the percentage of material purchased which goes into the final product.

Greater innovation of products

Percentage of income earned from products which did not exist last year. This will measure the ability of IC to develop successful products. (The existing measure would record unsuccessful products as innovation.)]

(iii) Lean manufacturing projects

The three projects link together as improvements to the quality of the manufacturing process at IC. There are common elements to these projects in the elimination of waste and empowerment of employees which will occur in the long term. In the short term, there may be increased costs due to these disruptive changes.

Just-in-time manufacturing (JIT)

JIT seeks to produce on a pull-basis to meet the customers' demands rather than to produce products for inventory, which then acts as a buffer between production levels and demand. The main impact of JIT is the reduction of inventory which is held. The main enablers for such a system are a need for close links to customers and suppliers in order to predict demand and to quickly supply that demand. In terms of IC's CSFs, this project will improve productivity as production lines must be made more flexible to meet changes in demand, although it should be noted that there could be a negative impact as constant changes in production lines will require more time to be spent setting up new production runs. It will also help to reduce wastage through losses in inventory as there will be less inventory. It also pushes some of the responsibility for improved quality of components (and reduced wastage) on to suppliers. However, it does not directly impact on product innovation.

The project will not necessarily immediately change any of the existing KPIs as it is about producing the right products at the right time not just more products for any given input and does not impact directly on new product launches.

Use kaizen costing

Kaizen costing aims to reduce current costs of production through continuous improvement. Each period, goals for lower costs are set and then performance monitored against these using variances. At the end of the period, a new lower cost goal is set for the next period. The process also often uses target costing to set the initial planned cost of a product thus incorporating the idea of only producing what the customer values. The purpose is to build into the control of the production process the idea of continuous improvement.

This project has the explicit aim of reducing waste and improving productivity and so is directly linked to the first two CSFs. As a result, it will have an impact on the KPIs which are related to productivity and resource consumption. The project will also require the empowerment of staff to make improvement decisions within their quality circles (teams) and so it may give scope for more innovative thinking. However, this thinking is not aimed at producing new products but at improving the production process, so new product innovation may only be affected indirectly.

Costs of quality and a 'zero defects' approach to manufacturing

Costs of quality can be broken down into four parts:

- prevention costs which occur before or during production and aim to prevent the production of defective products;
- appraisal costs which occur after production and aim to check that products meet quality standards;
- internal failure costs which occur when products are identified as defective before delivery to the customer and so are scrapped or reworked; and
- external failure costs which occur when defective products are delivered to the customer.

The 'zero defects' approach is also known as 'total quality management' (TQM). The TQM philosophy is that it is better to spend money on prevention, which involves challenging all aspects of the production process in order to improve and so avoid failure costs.

This project will affect the CSFs relating to improved productivity and waste by reducing defective products, provided that staff time is not adversely affected by aiming for perfection in production. In terms of the KPIs, it may lead to increased time in production but reduced wastage. It will not have a direct impact on power consumption. Again, this project is unlikely to affect the number of new products launched as it focuses on the production process not product development.

(iv) New information system

The move to a single database for the organisation will integrate the subsystems from different functions (such as production and sales). It will require existing systems to be networked and compatible or else be replaced. It will affect overall decision-making by improving the visibility of each function's operations to the others and to the strategic decision-makers. This shift is often achieved by using an enterprise resource planning system and a strategic enterprise management system.

The unified database will be critical in achieving the goal of JIT manufacturing as close links between production scheduling and demand forecasts will be required in order to match production runs with demand forecasts/orders. Also, the production schedules will need links to inventory levels in warehousing so that inventory is run down before new production is initiated. As closer communication with suppliers and customers will also be required, some change to existing information systems will be necessary in any case. It may be worthwhile to consider including electronic data interchange (EDI) in the specifications of the new system.

In using kaizen costing, cross-functional communication will be important. The design team will need to communicate with the production team so that the design is more easily streamlined for production. The financial systems will need to be frequently updated for information from the quality circles as improvements are made. This will affect the kaizen cost targets which need to be continually monitored and new targets set regularly. Quality circles often involve groups from across the business and so a common information system will facilitate communications amongst them.

The introduction of TQM will require clearer reporting of quality costs to assist in the on-going motivation of staff, which is often a problem in TQM. Informing the quality teams of the impact that increased prevention costs are having on lowering failure costs will be important in maintaining the push to zero defects. The quality improvements and changes to production processes will need to be communicated across IC's different sites which the new database can facilitate.

The nature of the data used in the current system is quantitative but with the new projects, there will be a need to communicate qualitative information, for example, relating to the nature of defects or the new production processes put in place. This will require a fundamental change to existing systems which again motivates the change to a new database.

2 Tutor note: This is a detailed solution and candidates would not be expected to produce an answer of this length.

(a) Weaknesses in the current budget process at Perkin

Perkin uses a traditional approach to budgeting, which has a number of weaknesses.

First of all the budgeting system does not seem aligned with Perkin's corporate objective which focuses on innovation and continuous product improvement. Innovation is a key competitive advantage to both component and device manufacturers in this industry and the products which incorporate Perkin's components are subject to rapid technological change as well as changes in consumer trends. The markets in which the two divisions operate appear to be evolving, as seen by the high popularity of the smartphone model which was designed for playing games. This may mean the distinction between smartphone and gaming devices could be becoming less clear cut. Management time would probably be better spent considering these rapid changes and currently the budgeting process does not facilitate that.

In reality, the budget process at Perkin is time consuming and probably therefore a costly exercise. Divisional budgets go through a lengthy process of drafting and then revision by the main board before they are approved. The approval often

happens after the start of the period to which they relate, at which point the budgets are already out of date. This also means divisional managers are trying to plan activities for the next financial year without a set of finalised targets agreed, which could impact the effectiveness of decisions made.

Another weakness is that the budgets are only prepared annually, which is clearly too infrequent for a business such as Perkin. The process is also rigid and inflexible as deviations from the planned targets are not tolerated. Sticking to rigid, annual budgets can lead to problems such as P Division not being able to cope with increasing popularity of a particular product and even other short-term changes in demand like those driven by seasonal factors, or one-off events such as the factory fire. Linked to this problem of budgetary constraints is that to cut costs to achieve the budgeted net profit, managers closed one of the three research and development facilities in G Division. As identified at the outset, a successful research and development function is a key source of long-term competitive advantage to Perkin.

It also appears that Perkin fails to flex the budgets and consequently the fixed budgets had discouraged divisional managers from deviating from the original plan. P Division did not make technical modifications to its components due to the cost of doing so, which meant they were unable to supply components for use in the new model of smartphone and had to discount the inventories of the old version. It is unclear why G Division did not take on additional staff to cope with increased demand following reopening of their customer's factory, but it may be because managers felt constrained by the budget. This then caused long-term detriment to Perkin as they lost the preferred supplier status with their main customer.

Another problem created by annual budgeting is the management of short-term changes in costs and prices. A key component of Perkin's products is silver, which fluctuates in price, and though it is not clear how much effect this has on Perkin's costs,

any problems in supply could disrupt production even if only a small amount of silver were required. Also Perkin exports goods worldwide and probably also purchases materials, including silver, from overseas. The business is therefore exposed to short-term movements in foreign currency exchange rates which may affect costs and selling prices.

Similarly, there also seems to be considerable uncertainty in sales volumes and prices which creates problems in the forecasting process for the two divisions. P Division did not anticipate the high demand for the new component which meant P Division had to discount products it had already manufactured in order to achieve its forecast sales volumes. G Division did correctly forecast the demand, but based on past growth in the market which may be too simplistic in a rapidly changing industry. Lack of up-to-date information will hinder decision-making and overall performance at Perkin. Perkin would perhaps be better adopting a rolling basis for forecasting.

The two divisions share manufacturing facilities and are likely to compete for other resources during the budgeting process. The current budgeting system does not encourage resource, information or knowledge sharing, for example, expertise in forecasting silver requirements. Divisional managers are appraised on the financial performance of their own division and hence are likely to prioritise the interests of their own division above those of Perkin as a whole. P Division would not re-allocate its manufacturing facilities to G Division, even though G Division needed this to cope with extra demand following reopening of the customer's factory. The current system is therefore not encouraging goal congruence between the divisions and Perkin as a whole and a budgeting system, if done effectively, should encourage co-ordination and co-operation.

Managers may find the budgeting process demotivating because it is time-consuming for them and then the directors override the forecast which they had made. It is also unfair and demotivating to staff to appraise them on factors which are outside their control. This also identifies another weakness in Perkin's budgeting system related to control as there does not seem to be any planning and operating variance analysis performed to assess exactly where performance is lacking and so no appropriate management information is provided. In fact it is not even clear just how often divisional managers receive reports on performance throughout the year. Any budgeting system without regular feedback would be ineffective. It should even be noted that for the industry in which Perkin operates the use of only budgetary targets as a measure of performance is narrow and internal. It should be utilising information from external sources as well to assess performance in a more relevant and contextual way.

Given the rapidly changing external environment and the emphasis on innovation and continuous product development, the current traditional budgeting method does not seem appropriate for Perkin.

(b) Beyond budgeting moves away from traditional budgeting processes and is suitable for businesses operating in a rapidly changing external environment and has the following features:

1. Encourages management to focus on the present and the future. Performance is assessed by reference to external benchmarks, utilising rolling forecasts and more non-financial information. This encourages a longer term view.
2. More freedom is given to managers to make decisions, which are consistent with the organisation's goals and achieving competitive success.
3. Resources are made available on demand, for example, to enable a division to take advantage of an opportunity in the market, rather than being constrained by budgets.
4. Management focus is switched to the customer and managers are motivated towards actions which benefit the whole organisation, not just their own divisions.
5. Effective information systems are required to provide fast and easily accessible information across the whole organisation to allow for robust planning and control at all levels.

Taking each of the elements of beyond budgeting in turn, the impact of introducing this technique into Perkin can be assessed.

At Perkin, there are rapid technological changes in the products being produced by customers and competitors as a result of changes demanded by the market, which mean that Perkin must respond and continuously innovate and develop its products. This will support Perkin's corporate objective. Consequently, this means that Perkin must change its plans frequently to be able to compete effectively with other component manufacturers and therefore will need to move away from annual incremental budgeting to introducing regular rolling forecasts. This process will need supporting by KPIs which will have a longer term focus. The impact of this will be that Perkin will need to develop a coherent set of strategies which supports its corporate objective, which will then need to be translated into targets and appropriate KPIs selected and developed. It will also mean that performance measures at the operational level will need to be revised from annual budgetary targets to these longer term objectives. Management at all levels will require training on the production of rolling forecasts and Perkin will need to assess if additional resources will also be required to run this new system.

Beyond budgeting focuses on the long-term success of the business by division managers working towards targets which may be non-financial. The use of external benchmarks and non-financial information will mean Perkin will need to put processes in place to collect this information and analyse it to assess performance. This will be a learning process as Perkin does not currently do this. The status of preferred supplier with key customers, for example, would be important to the long-term success of the business and this could be an objective which Perkin sets for its divisional managers.

Beyond budgeting allows authority to be delegated to suitably trained and supported managers to take decisions in the long-term interests of the business. It allows managers to respond quickly and effectively to changes in the external environment, and encourages them to develop innovative solutions to external change. In Perkin, budgets proposed by divisional managers are changed by the board to reflect its overall plans for the business. This means that a change in the approach to communication between the board and the divisions will be necessary as Perkin would need to switch from the top down process currently adopted to a more devolved decision-making structure. This will again require training for management to enable them to be ready to deal with this delegated authority as it will be very different from their existing approach.

Traditional budgeting may constrain managers who are not allowed to fail to meet the approved budget. This can be seen when P Division did not adapt its components because it did not want to incur the costs of doing so, which had not been budgeted for. Similarly, prices of raw materials are known to be volatile. Beyond budgeting makes resources available for managers to take advantage of opportunities in the market, such as the smartphone designed for playing games. Managers would also be able to react to changes in the price of materials or changes in foreign currency exchange rates, for example, by having the authority to purchase silver for inventory at times when the price of silver is low. This will mean that as a result there will be fewer budgetary constraints; however, these resources and targets will still need to be effectively managed. This management will mean that strategic initiatives invested in will need monitoring rather than closely scrutinising departmental budgets, which will be a significant change in Perkin.

In Perkin, the two divisions share some manufacturing facilities and are likely to compete for other resources, for example, when setting budgets. When manufacturing facilities are in short supply, each division will prioritise its own requirements rather than those of the business as a whole. Beyond budgeting encourages managers to work together for the good of the business and to share knowledge and resources. This is important in a business such as Perkin where product innovation is key and where the activities and products of the two divisions are similar. This coordinated approach will be new to Perkin so there will be a culture change. Also, the customer-oriented element of beyond budgeting is key here and will require the setup of customer focused teams which will require more harmonised actions in the divisions.

Each division currently has its own IT systems. In order to effectively share knowledge and to be able to respond to the external environment, which are key elements of beyond budgeting, it would be preferable for them to have shared IT facilities. This will mean that Perkin may have to invest in new technology capable of sharing information across the organisation in a rapid and open fashion but also be able to collect all relevant comparative data to allow for continuous monitoring of performance. This will facilitate better planning and control across all levels of Perkin.

With appropriate training of managers and investment in information systems, it would be relevant for Perkin to adopt beyond budgeting because of the rapid changes in the external environment in which it operates.

- 3 (a) The DMAIC process is a technique used to implement six sigma to improve existing processes and is split into five phases as described below.

Define the process

The CEO is concerned that the increase in returns from customers is increasing costs and threatens to affect the Posie brand. Six sigma focuses closely on the requirements of the customer and it is important to be clear exactly what customers' requirements are and in this case specifically why products are returned.

The objective of the project needs to be clear, in this case to reduce the number of customer returns.

Customers will expect certain minimum requirements from the manufacturing and packaging process, for example, that the furniture is able to be properly assembled and all the necessary components are included in the box. They will also expect the goods to be delivered undamaged within a reasonable time and at the time and date promised when the order was placed. Customers' perceptions of quality should correspond to the price paid, though different customers will have different expectations of this.

Beyond this basic requirement, there may be aspects of the manufacturing product which further enhance the customers' experience of the product and presumably of the Posie brand. Customers may be particularly pleased with furniture which is

delivered early or at a time especially convenient to them, or which is robust, durable and 'well-made'. These perceptions are subjective and may equally relate to design or the quality of raw materials as to the manufacturing process. By identifying where the products exceed customers' expectations, it may be possible to focus more on these aspects in the future. While products which significantly exceed customers' expectations will enhance the Posie brand, it may also indicate a quality of manufacture which is too high and allow Posie to reduce manufacturing costs in accordance with its cost leadership strategy whilst still having mainly satisfied customers.

Measure the existing process

The current returns figures do give some data as to why products are returned, but its usefulness is limited as it is unclear which of the categories relates to defective manufacture, and which relate to activities of other divisions. The ambiguity of the data and category definitions will need addressing to enable the process to be measured effectively.

Returns in Category 1 could be because the goods were not manufactured or packed properly in the manufacturing division, but could also be due to poor design, customers losing components or simply being unable to assemble furniture.

Damaged goods in Category 2 probably do not arise because of defective manufacturing either, though customers may wrongly categorise defective goods as damaged. For the other categories it is less clear. Though goods may become damaged by the distribution company, it seems that only a small number of returns relate directly to them.

Returns in Categories 3 and 4 could be due to defective manufacture or if the customer had simply changed their minds and no longer wanted the product. In Category 3, the identification of 'defective' items is too broad.

Returns in Category 5 which arrived late are clearly not due to manufacturing defects and as this causes only 2% of returns, is relatively insignificant.

Currently 10% of Posie's sales are of products from other manufacturers. There is no indication from the data given how many of the returns relate to these products, nor of the total number of returns relative to the number of items sold.

Therefore the existing data are insufficient to reliably measure existing performance and take no account of inputs such as raw materials. Only items which customers value should be measured. The CEO has suggested more detailed data are required, for example, on overall customer satisfaction with the manufacturing, but this is at 93% which already seems high and there is little point in incurring costs to measure what customers are already satisfied with. In the context of the six sigma project at Posie, there is little that can be done to improve this particular area and such items should not be measured.

Analyse the process

This stage is where the root causes of the problems are identified. Additional information may be needed, for example, to analyse customer returns by type of product, by country of sale or with a clearer definition of what is meant by 'defective'. By doing so, Posie may identify areas of the business where customer returns are particularly high and so be able to focus on these.

Improve the process

At this stage the proposals for improving the process are implemented and availability of resources and likely costs of making the improvements need to be carefully considered. Posie may need to consider which aspects of the production or packaging process could be improved, for example, by better maintenance or calibration of machinery. Additional training of staff may also be required.

Control

This is the on-going monitoring that the reduction in customer returns due to defective manufacturing is being maintained. Reporting on the number of returns may be done by exception if they reach a particular level. In Posie, it seems likely that the data on customer returns used to manage this process will need to be redesigned to make it clearer in which responsibility centre the problems arise. The ongoing monitoring may indicate that some of the earlier stages in the DMAIC process need to be revisited.

- (b) (i) The CEO wants to identify which responsibility centres are the root causes of the problem of customer returns. A responsibility centre is a part of the business where a manager has specific authority and accountability for its performance and so Posie will need information relating to aspects of performance specific to the centre. For example, performance data relating to the reasons for customer returns need to be clearly segregated between responsibility centres. Currently, the information compiled on customer returns does not do this and some categories of return may result from manufacturing defects but some will be from problems outside the manufacturing division, or even outside Posie itself, for example, from poor quality raw materials purchased externally, or because of late deliveries or damaged goods caused by the distribution company.

Once information has been analysed and responsibility has been identified, then the managers of those areas will need the information drilled down into even further, as in order to improve they need to know which specific areas they can control. It would be unfair to make managers responsible for aspects of performance which they are unable to control, and the board member responsible for manufacturing quality has recently resigned because of this.

Posie needs to ensure it produces performance data to an appropriate level of detail so as not to overload the users with too much data. For board level reporting, the information in the current board reporting pack may be too detailed and it would be sufficient just to produce summary data on the overall level of returns relative to sales. Responsibility centres would need much more detailed information, perhaps even down to product or production line level.

However, Posie should also consider the costs and resources required to provide more detailed performance data. Given

Posie's cost leadership strategy, the costs of data collection may outweigh the benefits of doing so.

Performance data should be provided at an appropriate frequency. For the Posie main board, monthly reporting may be sufficient to alert them to any problems. Responsibility centres will need much more frequent, even daily or weekly details of the levels of customer returns so that they can react quickly to any problems identified. At the moment, the returns data are compiled every six months, possibly due to the difficulties in obtaining data from the IT systems in the overseas businesses. Even for a board level report, this seems much too infrequent.

- (ii) At the moment, the overseas subsidiaries are being designated as profit centres and managers will be held accountable for both revenues and costs. As they do not manufacture, it seems reasonable to designate them as revenue centres. As such, managers would be held accountable for just revenues as they have little or no control over costs as most goods for resale are purchased from the manufacturing division.

The performance data produced by Posie's subsidiaries' IT systems will therefore switch to focus more on revenues rather than costs. As revenue centres they may well have some freedom to change selling prices. Posie will need to ensure the subsidiaries have information to monitor the impact of different pricing strategies and will need to provide the management of these subsidiaries with information gleaned from the external environment. It will be important to evaluate competitors' pricing strategies when making pricing decisions.

A potential problem with providing only performance data relating to revenue is that managers could focus too much on achieving revenue targets rather than maintaining or improving profitability. As they are autonomous subsidiaries, there will be aspects of their own costs, such as staffing costs and other overheads, which they will be able to have some control over. It is important that Posie ensures the management still has sight of this information to ensure that such costs are still controlled effectively.

Furthermore, if the overseas managers are only held responsible for sales, this may mean they do not focus sufficiently on addressing reasons why goods are returned, and so levels of returns may increase. This means that once Posie undertakes the exercise to identify the root causes of the returns from customers, this information is shared and monitored.

Posie needs to be aware of these issues when determining information requirements if the reclassification of the subsidiaries goes ahead. It will not be as simple as assuming that they will now only need information on revenues.

- 4 (a) The balanced scorecard consists of four perspectives: customer, internal, innovation and learning and financial. It requires an organisation to have a number of goals supported by performance measures in each perspective. The customer perspective measures what it is that customers value from the business; internal looks at what processes does the organisation need to be successful; innovation and learning considers how future value can be created and financial measures whether performance is acceptable to investors.

It is useful because it uses both internal and external information to assess performance and measures financial and non-financial aspects of a business to ensure long-term future success, rather than just focusing on historic results. It can also be used as a mechanism to link KPIs into the CSFs which are vital to deliver strategy.

Soup currently uses return on capital employed (ROCE) as its key financial performance measure, but this does not correlate directly with the objective to maximise shareholder wealth and could encourage short-term decisions to be taken at the expense of long-term success. This is the case at Soup which purchased old trains and subsequently failed to reinvest, meaning that Soup's ROCE is probably higher than its rivals. However, the trains are becoming unreliable and their condition is deteriorating. In the long term this will reduce customer satisfaction and financial performance.

Using the scorecard, Soup should have a broader range of financial measures which encourage managers to take decisions, such as investment decisions, consistent with the objective to maximise shareholder wealth in the long term. EVA would be a suitable measure to help achieve this, and would be preferable to the current focus on ROCE.

Soup does measure growth in passenger numbers which could be a measure of customer satisfaction. However, it is a limited, quantitative measure. Though Soup does have rivals and is likely to be required to operate a specified level of service under the terms of the licence from the government, some passengers may be forced to travel on Soup trains, rather than those of another operator because of where they live or the times they need to travel. The number of operators (competitors) is limited by the capacity of the railway infrastructure as well as by passenger demand. This means that the level of repeat customers may not be appropriate for Soup.

Passenger numbers are also externally focused but again this fails to fully consider the environment in which Soup operates.

Within the customer perspective Soup could use a range of performance measures. This will be beneficial as where passengers are able, they are likely to choose to use Soup if they provide a good service. This can be easily measured by surveying or asking passengers' opinions. This will give Soup more qualitative information about their customers and their expectations, which will vary, for example, passengers will have different perceptions of overcrowding, or what is an acceptable delay. Certain groups may be more affected by overcrowding like frequent travellers and the elderly. Passengers who are unable to find a seat will probably be the most dissatisfied, though this will depend on how long their journey is. Other aspects of Soup's service may be less valued than reliability and occupancy, like wireless access and the on-board cafe, but will be important to certain groups.

Another key element of customer satisfaction will relate to the amount of fare paid. Fares are regulated in Deeland so the interaction between fares and other aspects of the service is unknown. Many customers while valuing a particular aspect of the service may be unwilling to pay more for it; some may accept a reduction in the level of service if fares were reduced.

This detailed information about customers will allow Soup to focus performance improvements on key areas using more external data to make decisions.

Measures of the internal processes are likely to be closely linked to customer satisfaction. Soup apparently neglects this area in its performance management system. The scorecard could be used to help to address reliability, overcrowding and environmental factors.

Reliability will be highly valued by customers especially those who travel frequently and who rely on rail travel to get to work. The number of trains arriving late would be a suitable measure of reliability, as would the number of train services cancelled, though the length of the delay is also critical and should be carefully defined. The scorecard would allow more detailed measures as some of the factors affecting reliability will be within Soup's direct control but others such as failures in the railway infrastructure are controlled by the government. This is useful information for Soup to effectively assess their controllable performance and feedback as necessary to external parties.

Seat occupancy, the number of passengers on a train compared to the number of available seats on different routes and at different times, is a suitable measure of train overcrowding and is important for passenger safety. To fully utilise its trains and achieve its objective of maximising shareholder wealth, Soup must try and maximise both the seat occupancy and the amount of time its trains are actually running. These internal measures would then help to support financial targets.

Soup's licence to operate rail services in Regions A and B expires in three years' time, and as with the operator from whom Soup purchased the trains, it may not be renewed. Soup must balance the needs of shareholders for short-term increases in dividends and share price with the long-term need to renew to its operator's licence.

The creation of long-term future value can be addressed by the innovation and learning perspective. The immediate scope to innovate the service experienced by the passenger is limited, but there are some quick wins available in the choice in the on-board cafe and improving the reliability of the internet access. Also time spent training staff may improve customer satisfaction and reduce maintenance time. Fundamental innovation like the use of faster or environmentally less harmful trains requires long-term planning and large capital investment. The scorecard will encourage Soup to be forward looking, unlike the present system which is limited to historic performance.

- (b) To measure the extent of overcrowding, some measure of occupancy is needed. The number of passengers per available seat can be used as a measure of occupancy.

Seats available per train is 490 (7 coaches x 70 seats) in Region A and 420 (7 coaches x 60 seats) in Region B.

Seats available per day	Region A	Region B
Peak times	1,960 (490 x 4)	1,680
Other times	2,940	3,360
Seat occupancy	Region A	Region B
Peak times	128%	83%
Other times	83%	55%

Total seat occupancy = 82.5% (8,200/9,940)

Overall occupancy is below 100% which means on average there are more seats available than passengers, which is not consistent with the government's claims that the trains are overcrowded. However, these averages may be misleading as trains running on certain days or at certain times may be relatively overcrowded. This may generate customer dissatisfaction even on services which are on average not fully occupied. The total number of passengers without seats would be a better measure.

There are significant variations between regions and times travelled with only the trains in Region A travelling at peak times being over occupied. This affects only 18% (4/22) of all services.

Most affected by this will be the 28% of the passengers travelling at peak times in Region A who are unable to obtain a seat. This represents only 9% (28% x 2,500/8,200) of total passengers per day. There is some overcrowding but the claim that Soup's trains are overcrowded seems exaggerated given the data provided. However, certain routes or specific times or sections of the trains may be more affected and more analysis is needed.

The impact of overcrowding on passengers also depends on journey times, with passengers being less satisfied by not obtaining a seat on longer journeys rather than on short ones. Assuming trains are available for 14 hours per day and there are 22 services, each service is on average almost 1.5 hours which may be a significant length of time for passengers to stand on a train.

- (c) When applying the balanced scorecard in Soup, the measures need to be chosen carefully. A balance needs to be struck and only measures which help Soup to achieve its objectives should be chosen. Currently Soup focuses on short-term financial measures such as return on capital employed, whereas the balanced scorecard considers more long-term measures.

Some measures are more important than others, so prioritising measures will be difficult. Customers may value some aspects of the service more than others, for example, the choice available in the on-board cafe is probably unimportant to most passengers provided they can obtain some food and drink. The punctuality of Soup's trains or whether they even run at all is fundamental to achieving customer satisfaction and needs careful measurement. Soup must have measures for regulatory or safety reasons too.

Some aspects of the business may be harder to measure than others. For example, it may be relatively easy to measure seat occupancy as a measure of overcrowding, but passengers' perceptions of overcrowding may differ. Non-financial aspects such as customer satisfaction may be subjective and any surveys done may not reflect the experience of the majority of passengers.

Performing and analysing surveys would also be time consuming and resource intensive.

Measures chosen may conflict. Overcrowding may be unwelcome by passengers but making them less crowded conflicts with Soup's presumed objective of fully occupied trains. Time spent maintaining trains to reduce their impact on the environment or ensure reliability will mean they are not operational for periods of time, though safety will be a key factor here.

Care must be taken to avoid overloading with too many performance measures. The current objective to maximise shareholder wealth is very broad. Having a clearer strategy would enable Soup to determine suitable performance measures so it is not overloaded with KPIs which do not contribute towards achieving this strategy.

Professional Level – Options Module

Advanced Performance Management

March/June 2016 – Sample Questions



Time allowed

Reading and planning: 15 minutes

Writing: 3 hours

This question paper is divided into two sections:

Section A – This ONE question is compulsory and MUST be attempted

Section B – TWO questions ONLY to be attempted

Present Value and Annuity Tables are on pages 12 and 13.

Do NOT open this question paper until instructed by the supervisor.

During reading and planning time only the question paper may be annotated. You must NOT write in your answer booklet until instructed by the supervisor.

This question paper must not be removed from the examination hall.

Think Ahead



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Section A – This ONE question is compulsory and MUST be attempted

- 1** Flack Supermarkets (Flack) is a multi-national listed business operating in several developing countries. The business is divided into two divisions: Metro, which runs smaller stores in the densely populated centres of cities and Hyper, which runs the large supermarkets situated on the edges of cities. Flack sells food, clothing and some other household goods.

Competition between supermarkets is intense in all of Flack's markets and so there is a constant need to review and improve their management and operations. The board has asked for a review of their performance report to see if it is fit for the purpose of achieving the company's mission of being:

'...the first choice for customers by providing the right balance of quality and service at a competitive price. We will achieve this through acting in the long-term interests of our stakeholders: earning customer loyalty, utilising all our resources and serving our shareholders' interests.'

This report is used at Flack's board level for their annual review. The divisional boards have their own reports. Also, there has been criticism of the board of Flack in the financial press that they are 'short-termist' and so the board wants your evaluation of the performance report to include comments on this. A copy of the most recent report is provided as an example at Appendix 1.

The board is considering introducing two new performance measures to address the objective of 'utilising all our resources'. These are revenue and operating profit per square metre. The CEO also wants an evaluation of these two measures explaining how they might address this aspect of the mission, what those ratios currently are and how they could be used to manage business performance. There is information in Appendix 1 to assist in this work.

There have been disagreements between Flack's divisional management about capital allocation. The divisions have had capital made available to them. Both sets of divisional managers always seem to want more capital in order to open more stores but historically have been reluctant to invest in refurbishing existing stores. The board is unsure of capital spending priorities given that the press comments about Flack included criticism of the 'run-down' look of a number of their stores. The board wants your comments on the effectiveness of the current divisional performance measure of divisional operating profit and the possibility of replacing this with residual income in the light of these problems.

As the company is opening many new stores, the board also wants an assessment of the use of expected return on capital employed (ROCE) as a tool for deciding on new store openings, illustrating this using the data in Appendix 2 on one new store proposal. The focus of comments should be on the use of an expected value not on the use of return on capital employed, as this is widely used and understood in the retail industry.

Finally, the CEO has proposed to the board that a new information system be introduced. She wishes to spend \$100m on creating a loyalty card programme with a data warehouse collecting information from customers' cards regarding their purchases. Her plan is to use this information to target advertising, product range choices and price offers more efficiently than at present.

Required:

Write a report to the board of Flack to:

- (i) Evaluate the performance report of Flack, using the example provided in Appendix 1, as requested by the board. (14 marks)
 - (ii) Evaluate the introduction of the two measures of revenue and operating profit per square metre, as requested by the CEO. (8 marks)
 - (iii) Assess the proposal to change the divisional performance measure. (8 marks)
- Note: No calculations of the current values are required. (8 marks)
- (iv) Calculate the expected return on capital employed for the new store and assess the use of this tool for decision-making at Flack. (8 marks)
 - (v) Explain how the proposed new information system can help to improve business performance at Flack. (8 marks)

Professional marks will be awarded for the format, style and structure of the discussion of your answer.

(4 marks)

(50 marks)

Appendix 1 Board's performance report

Flack Year to 31 March

	Metro Budget 2016 \$'000	Metro Actual 2016 \$'000	Hyper Budget 2016 \$'000	Hyper Actual 2016 \$'000	Flack Budget 2016 \$'000	Flack Actual 2016 \$'000	Flack Actual 2015 \$'000	Change on PY
Revenue								
Food	1,093,521	1,104,567	5,431,277	5,542,119	6,524,798	6,646,686	6,513,752	2.04%
Clothes	765,465	773,197	3,801,894	3,879,483	4,567,359	4,652,680	4,536,363	2.56%
Other goods	328,056	331,370	1,629,383	1,662,636	1,957,439	1,994,006	1,964,096	1.52%
Total	2,187,042	2,209,134	10,862,554	11,084,238	13,049,596	13,293,372	13,014,211	2.15%
Cost of sales	1,994,583	2,014,730	10,199,937	10,408,099	12,194,520	12,422,829	12,186,796	1.94%
Gross profit	192,459	194,404	662,617	676,139	855,076	870,543	827,415	5.21%
Gross margins		8.80%		6.10%		6.55%		
Other operating costs	34,993	35,346	173,801	177,348	208,794	212,694	208,227	
Operating profit	157,466	159,058	488,816	498,791	646,282	657,849	619,188	6.24%
Operating margins		7.20%		4.50%		4.95%		
Finance costs					76,993	79,760	75,482	
Group profit before tax					569,289	578,089	543,706	6.32%
Tax					142,322	144,522	135,926	
Group profit after tax					426,967	433,567	407,780	6.32%
Total shareholder return						3.10%	2.70%	
Return on capital employed	13.2%	13.3%	13.2%	13.5%	13.2%	13.4%	13.2%	
Number of stores		533		208				
Total square metres		161,227		841,967				

Appendix 2 New store

The following data has been forecast by the marketing department for the new store based on Flack's existing experience. There are three possible scenarios:

Demand scenarios	Low	Medium	High
Revenue (\$m)	12.5	13	13.5
Probability (%)	20	50	30
Forecast operating margin (%)	4.1	4.3	4.4

The new store is expected to cost \$4.2m to buy, fit out and stock. The target ROCE for Flack has been set at 13%.

Section B – TWO questions ONLY to be attempted

- 2 Cuthbert is based in Ceeland and manufactures jackets for use in very cold environments by mountaineers and skiers. It also supplies the armed forces in several countries with variants of existing products, customised by the use of different coloured fabrics, labels and special fastenings for carrying equipment. Cuthbert incurs high costs on design and advertising in order to maintain the reputation of the brand.

Each jacket is made up of different shaped pieces of fabric called 'components'. These components are purchased by Cuthbert from an external supplier. The external supplier is responsible for ensuring the quality of the components and the number of purchased components found to be defective is negligible. The cost of the components forms 80% of the direct cost of each jacket, and the prices charged by Cuthbert's supplier for the components are the lowest in the industry. There are three stages to the production process of each jacket, which are each located in different parts of the factory:

Stage 1 – Sewing

The fabric components are sewn together by a machinist. Any manufacturing defects occurring after sewing has begun cannot be rectified, and finished garments found to be defective are heavily discounted, or in the case of bespoke variants, destroyed.

Stage 2 – Assembly

The garments are filled with insulating material and sewn together for the final time.

Stage 3 – Finishing

Labels, fastenings and zips are sewn to the finished garments. Though the process for attaching each of these is similar, machinists prefer to work only on labels, fastenings or zips to maximise the quantity which they can sew each hour.

Jackets are produced in batches of a particular style in a range of sizes. Throughout production, the components required for each batch of jackets are accompanied by a paper batch card which records the production processes which each batch has undergone. The batch cards are input into a production spreadsheet so that the stage of completion of each batch can be monitored and the position of each batch in the factory is recorded.

There are 60 machinists working in the sewing department, and 40 in each of the assembly and finishing departments. All the machinists are managed by 10 supervisors whose duties include updating the batch cards for work done and inputting this into a spreadsheet, as well as checking the quality of work done by machinists. The supervisors report to the factory manager, who has overall responsibility for the production process.

Machinists are paid an hourly wage and a bonus according to how many items they sew each week, which usually comprises 60% of their total weekly wages.

Supervisors receive an hourly wage and a bonus according to how many items their team sews each week. The factory manager receives the same monthly salary regardless of production output. All employees are awarded a 5% annual bonus if Cuthbert achieves its budgeted net profit for the year.

Recently, a large emergency order of jackets for the Ceeland army was cancelled by the customer as it was not delivered on time due to the following quality problems and other issues in the production process:

- A supervisor had forgotten to input several batch cards and as a result batches of fabric components were lost in the factory and replacements had to be purchased.

- There were machinists available to sew buttons onto the jackets, but there was only one machinist available who had been trained to sew zips. This caused further delay to production of the batch.
- When the quality of the jackets was checked prior to despatch, many of them were found to be sewn incorrectly as the work had been rushed. By this time the agreed delivery date had already passed, and it was too late to produce a replacement batch.

This was the latest in a series of problems in production at Cuthbert, and the directors have decided to use business process reengineering (BPR) in order to radically change the production process.

The proposal being considered as an application of BPR is the adoption of 'team working' in the factory, the three main elements of which are as follows:

1. Production lines would re-organise into teams, where **all** operations on a particular product type are performed in one place by a dedicated team of machinists.
2. Each team of machinists would be responsible for the quality of the finished jacket, and for the first time, machinists would be encouraged to bring about improvements in the production process. There would no longer be the need to employ supervisors and the existing supervisors would join the teams of machinists.
3. The number of batches in production would be automatically tracked by the use of radio frequency identification (RFID) tags attached to each jacket. This would eliminate the need for paper batch cards, which are currently input into a spreadsheet by the supervisors.

You have been asked as a performance management consultant to advise the board on whether business process reengineering could help Cuthbert overcome the problems in its production process.

Required:

- (a) Advise how the proposed use of BPR would influence the operational performance of Cuthbert. (14 marks)
- (b) Evaluate the effectiveness of the current reward systems at Cuthbert, and recommend and justify how these systems would need to change if the BPR project goes ahead. (11 marks)

(25 marks)

- 3 Dibble is formed of two autonomous divisions, Timber and Steel, and manufactures components for use in the construction industry. Dibble has always absorbed production overheads to the cost of each product on the basis of machine hours.

Timber Division

Timber Division manufactures timber frames used to support the roofs of new houses. The timber, which is purchased pre-cut to the correct length, is assembled into the finished frame by a factory worker who fastens the components together. Timber Division manufactures six standard sizes of frame which is sufficient for use in most newly built houses.

Steel Division

Steel Division manufactures steel frames and roof supports for use in small commercial buildings such as shops and restaurants. There is a large range of products, and many customers also specify bespoke designs for short production runs or one-off building projects. Steel is cut and drilled using the division's own programmable computer aided manufacturing machinery (CAM), and is bolted together or welded by hand.

Steel Division's strategy is to produce novel bespoke products at a price comparable to the simpler and more conventional products offered by its competitors. For example, many of Steel Division's customers choose to have steel covered in one of a wide variety of coloured paints and other protective coatings at the end of the production process. This is performed off-site by a subcontractor, after which the product is returned to Steel Division for despatch to the customer. Customers are charged the subcontractor's cost plus a 10% mark up for choosing this option. The board of Steel Division has admitted that this pricing structure may be too simplistic, and that it is unsure of the overall profitability of sales of some groups of products or sectors of the market.

Recently, several customers have complained that incorrectly applied paint has flaked off the steel after only a few months' use. More seriously, a fast food restaurant has commenced litigation with Dibble after it had to close for a week while steel roof frames supplied by Steel Division were repainted. Following this, the production manager has proposed increasing the number of staff inspecting the quality of coating on the frames, and purchasing expensive imaging machinery to make inspection more efficient.

The chief executive officer (CEO) at Dibble has approached you as a performance management expert for your advice. 'At a conference recently', he told you, 'I watched a presentation by a CEO at a similar business to ours talking about the advantages and disadvantages of using activity based costing (ABC) and how over several years the adoption of activity based management (ABM) had helped them to improve both strategic and operational performance.'

'I don't want you to do any detailed calculations at this stage, but I'd like to know more about ABC and ABM, and know whether they would be useful for Dibble', he said.

You are provided with extracts of the most recent management accounts for Timber and Steel Divisions:

Division (\$000)	Timber	Steel
Revenue	25,815	20,605
Materials	12,000	10,100
Direct labour	4,500	850
Subcontract costs	75	650
Analysis of production overheads (\$000)		
Set up time for CAM machinery	–	575
Machining time	–	2,777
Storage of goods awaiting or returned from subcontractors	120	395
Transfer of goods to and from subcontractors	50	300
Inspection and testing	35	425
Total production overheads	205	4,472
Gross profit	9,035	4,533

Required:

- (a) (i) Advise the CEO how activity based costing could be implemented. (4 marks)
- (ii) Assess whether it may be more appropriate to use activity based costing in Timber and Steel Divisions than the costing basis currently used. (8 marks)
- (b) Advise the CEO how activity based management could be used to improve business performance in Dibble. (13 marks)
- (25 marks)**

4 Universities in Teeland have three stated objectives:

- To improve the overall standard of education of citizens in Teeland.
- To engage in high quality academic research.
- To provide well-qualified university graduates to meet the needs of the graduate jobs market in Teeland.

Each university is funded by a fixed sum of money from the Teeland government according to the number of students studying there. In addition, universities receive extra funds from the government and also from other organisations, such as large businesses and charities. These funds are used to support academic research.

Following the onset of an economic recession, the Teeland government has stated its intention to reduce spending on publicly funded services such as the universities. One senior politician, following his recent visit to neighbouring Veeland, was controversially quoted as saying:

'The universities in Veeland offer much better value for money for the citizens there compared to our universities here in Teeland. There are 25 students for each member of academic staff in Veeland, whereas in Teeland, the average number is 16, and yet, the standard of education of citizens is much higher in Veeland. The Veeland government sets

targets for many aspects of the services delivered by all the universities in Veeland. Furthermore, league tables of the performance of individual universities are published on the internet, and university leaders are given bonuses if their university falls within the top quarter of the league table. In Veeland, the system of performance measurement of the universities is considered so important that there is a special government department of 150 staff just to measure it.'

He went on to add, 'I want to see a similar system of league tables, targets and bonuses for university leaders being introduced here in Teeland. To appear near the top of the league tables, I think we should expect each university to increase the number of graduates entering graduate jobs by at least 5% each year. I would also like to see other steps taken to increase value for money, such as reducing the number of academic staff in each university and reducing the salary of newly recruited academic staff.'

You have been asked to advise the Teeland government on the measurement of value for money of the universities and the proposed introduction of league tables for comparing their performance. Appendix A contains details and existing performance data relating to four of the best known universities in Teeland.

Northcity University is famous for its high teaching standards and outstanding academic research in all subjects. As such, it attracts the most able students from all parts of the world to study there.

Southcity University is a large university in the capital city of Teeland and offers courses in a wide range of subjects, though most of the funding it receives for academic research is for science and technology in which it is particularly successful.

Eastcity University is a small university specialising in the teaching of arts and humanities subjects such as history and geography.

Westcity University currently offers less strict entry standards to students to attract students from more diverse backgrounds, who may not normally have the opportunity of a university education.

Appendix A

Existing university performance data

	North	South	East	West
Number of students	17,600	30,400	5,200	11,200
Number of academic staff	1,750	2,400	485	625
Entry requirements ¹	100	77	72	48
Total annual payroll cost of academic staff	\$109m	\$149m	\$20m	\$37m
Graduate jobs filled each year ²	4,180	6,555	1,154	1,750
Funds received for academic research	\$491m	\$474m	\$26m	\$14m
TSOR survey rating ³	84%	76%	73%	90%
Position in league table ⁴	1	11	14	21

Key to performance data

¹ – Entry requirements represent students' average attainment in examinations prior to entering university. The entry requirement of the highest ranking university is scored as 100, with the score of all other universities being in proportion to that score.

² – The number of graduates each year who go on to further study or who begin jobs normally undertaken by university graduates. In Teeland, students attend university for an average of 3.2 years.

³ – The TSOR (Teeland students overall satisfaction rating) survey is undertaken by the Teeland government to assess students' overall satisfaction with the standard of teaching, the social and support aspects of university life and their optimism for their own future job prospects.

⁴ – The education department of the Teeland government has produced a provisional league table ranking the overall performance of each of the 45 universities in Teeland, with 1 being the highest ranking university. This has been compiled using a number of performance measures, weighted according to what the government believes are the most important of these measures.

Required:

- (a) Advise the Teeland government how it could assess the value for money of the universities in Teeland, using the performance data in Appendix A. (12 marks)

- (b) Assess the potential benefits of league tables for improving the performance of universities in Teeland and discuss the problems of implementing the proposal to introduce league tables. (13 marks)

(25 marks)

Answers of Above Question Paper

Professional Level – Options Module, Paper P5
Advanced Performance Management

March/June 2016 Sample Answers

1 Report

To: Board of Flack
From: A. Accountant
Date: June 2016
Subject: Performance reporting and management issues at Flack

Introduction

This report evaluates the current performance report for Flack and the introduction of two new performance measures. Then, the effect of a proposed change in divisional performance measure is assessed. Next, the use of expected ROCE for new store proposals is evaluated. Finally, the report explains how the proposed new information system can help to improve business performance at Flack.

(i) Performance reporting at Flack

The current report has a number of strengths and weaknesses. These will be discussed according to whether the report:

- addresses the mission,
- contains appropriate information for decision-making,
- shows signs of being short term and
- is well presented.

The current mission can be broken down into two parts:

- to be the first choice for customers and
- to provide the right balance of quality, service and price.

There are three strategies for achieving this mission, reflecting stakeholder concerns:

- earning customer loyalty,
- utilising all resources and
- serving shareholders' interests.

The report does not address the first part of the mission. This can only be measured using external data but the report is utilising only Flack's internal data. This part of the mission relates to the first strategy to gain customer loyalty. Customer loyalty could be gauged through repeat purchases or market share information but neither is supplied. This is clearly important to a retailer and may be more easily gathered once the data from the new information system are available for inclusion in this report.

The report provides no measures of the balance of quality, service and price other than through the historic growth in revenue. It would only be through comparison with competitors or customer survey data that a picture of the mix of these qualities could be gained.

The second strategy of utilising resources requires that the key resources be identified. Clearly, the stores themselves (and thus the capital invested) are an important resource and the introduction of the revenue and profit per square metre and comparison with competitors will indicate the efficiency of their use. However, there are likely to be other important resources such as staff and no measure of their performance is offered. Staff costs are not shown in the trading account although a more sophisticated measure such as revenue per employee is a commonly used metric and would address this.

The report is much better on the third strategy of serving shareholder interests as it supplies two helpful measures: total shareholder return and return on capital employed. However, most shareholders will want comparison with benchmark returns within the retail sector and the market more widely, since these represent their alternatives.

The criticism of the company's management as being short term is reflected in the performance reporting. The report only contains for comparison budget information and the previous year's figures. There are no longer term forecasts or information on future capital investment. Also, there are few indicators which would be described as determinants of performance. These are often non-financial and focused on the external business environment (behaviour of customers and competitors).

As already noted, there is a significant gap in the information in the report as it contains no external information. Also, although revenue is broken down into broad product categories, no further information about growth within these categories nor the margins being earned is supplied. As a result, it could be questioned whether this break-down is worthwhile.

In terms of presentation, the data is clear and in a form which would be easily recognisable to those used to reading accounts. However, no narrative commentary is provided which would highlight the key features in the report such as major deviations from the budget or performance well outside industry norms. There should be a comment on each of the five areas within the mission and strategies as well as comments about specific, material issues arising in the period covered. The report could be made easier to read by reducing the volume of numbers present both by cutting out unnecessary measures (see earlier discussion of product categories) and also by rounding all figures to millions.

(ii) New asset utilisation indicators

Revenue and operating profit per square metre reflect the utilisation of the key capital asset used in their generation (the store). Therefore, they are directly addressing a major part of the aim of utilising all resources, however, they do not address *all* resources which the business uses. There are likely to be significant staff costs and so similar measures of revenue and operating profit per employee could also be introduced in order to reflect these human resources.

	Metro	Hyper	Flack
Revenue per sq. metre	13,702	13,165	13,251
Operating profit (\$'000s)	159,058	498,791	657,849
Operating profit per sq. metre	987	592	656

These measures reflect the importance of the use of the store's space which is an area which the business does not give sufficient attention as is reflected in the problems with divisional performance measures. Focus on these measures will require addressing issues of volume of sales and the profitability of those sales. The two types of store at Flack will have different impacts on these measures. For example, the smaller Metro stores may be capable of earning higher margins as they are convenient to customers while selling lower volumes. The Hyper stores may concentrate on selling in volume to customers who come to buy in bulk. However, in terms of the overall performance of the business it is essential that Flack sells in high volumes as it is a low margin business but it must not sacrifice profitability, in effect buying customers' revenue by selling at or near a loss.

(iii) Divisional performance assessment

The current measure of divisional operating profit reflects the trading in the period under consideration. Profit will link to the whole business's operating profit which is the correct level to reflect the efforts of the divisional managers. However, this measure only indirectly addresses the capital being used by the divisions (depreciation charged to operating profit). This is distorting the behaviour of the divisional managers.

The managers are not investing in refurbishing their stores which is causing the press (and presumably customers) to notice their run-down appearance. This may reduce the depreciation charge against operating profit. They are prioritising new store capital expenditure over the refurbishment since they are not being charged for the use of that capital (financing charges are deducted after operating profit is calculated). This may not be optimal since small spending on existing capital assets often yields higher returns than new spending (which may be subject to greater risks).

The proposal to change the divisional performance measure addresses the issue of not reflecting the capital used since residual income (RI) deducts an imputed interest charge. Divisions can then be set targets in terms of their RI. The difficulties in calculating RI lie in correctly setting the imputed interest rate and calculating the capital being employed by the division. However, since both divisions are types of stores they will have similar assets and so the same rules can be applied to each to fairly calculate the capital used. An advantage of RI is that the imputed interest rate can be changed to reflect the different risks of the divisions. The two divisions here do not seem to have significant risk differences unless the geographical locations introduce these (city centres and city edges). However, it is worth noting that using RI can discourage investment. As net book values of assets fall over time, RI automatically increases and 'do not invest' could become an attractive option to the managers.

Overall, the proposed change addresses existing problems and would be considered a normal solution to measuring divisional performance in this industry.

(iv) Use of expected ROCE in new store appraisal

The expected ROCE is calculated as:

Demand scenarios	Low	Medium	High
Revenue (\$m)	12.5	13	13.5
Probability (%)	20	50	30
Forecast operating margin (%)	4.1	4.3	4.4
Forecast operating profit (\$m)	0.5125	0.559	0.594
Expected operating profit (\$m)	0.5602		
Expected ROCE	13.34%		

The expected ROCE is above 13% which is Flack's required ROCE, so this should be an acceptable investment.

The use of expected values in the calculation of ROCE is appropriate if the probabilities used can be reasonably estimated and the decision is likely to be one which is made a number of times. Since Flack has opened many stores, it is likely to be able to predict volumes and margins with reasonable accuracy. Since Flack is going to continue to open stores, this decision will occur a number of times which makes using a probabilistic approach viable. In general, ROCE is neither considered as accurate nor as direct a measure of shareholder wealth as, for example, net present value (NPV).

(v) Loyalty card system

The proposed new information system will collect data from customers' purchases and store it for data mining purposes in a data warehouse. The capital required will be significant at \$100m (the equivalent of about 24 new stores at \$4.2m each). There will also be considerable annual running costs. However, the benefits could be significant although quantifying them will be difficult as they depend on influencing customer behaviour and so are not simply cutting costs.

The new system will help to address the mission of Flack as it will help the board to understand customers better and so improve their loyalty to the business. By focusing offers on those things which customers enjoy Flack can enhance the brand and also take the opportunity to sell greater volumes alongside the offered products.

The data warehouse will allow data mining for relationships, for example, geographical preferences for products; links between price offers and volumes sold; products which are often bought together; seasonality of product purchases. These relationships can then be used to address the CEO's three target areas of advertising, product range choices and price offers.

Potentially, there will be cost savings by more efficient advertising. The data on each individual customer can be searched to profile customers and identify their individual preferences. Marketing can then be targeted to groups of customers using products which they commonly buy. Data mining will also identify associated products (those often bought together) so that offers can be grouped, for example, with a price reduction on buying a linked pair of products.

A problem in most retail businesses is the size of the product portfolio which they offer since more products (and potentially more suppliers) require more effort to manage. The new system may allow a Pareto-style analysis where the least profitable non-essential products are identified and can be cut from the product range.

- 2 (a) Business process reengineering (BPR) involves radical and fundamental changes in the way processes in organisations are designed. A focus on the needs of the customer, and customer satisfaction, are key to BPR. BPR aims to improve key performance measures such as reducing costs, improving quality, service delivery and customer satisfaction.

The proposal is to move away from the existing functional structure where staff are attached to only one stage of the production process, or even to one type of machine within each function, to team working. This is a radical change for Cuthbert and as such, is an example of BPR.

Reorganising into teams

Currently, there is very little multi-skilling of production staff at Cuthbert. This was seen where there were insufficient trained zip machinists available for the emergency order for the Ceeland army, even though there were enough machinists to sew buttons. This led to the emergency order failing to meet the customer's requirements as it was not delivered on time.

Furthermore, it seems that machinists also prefer to work on one particular type of machine. This is probably because they are currently rewarded according to the speed of production, rather than the quality of production, and can work faster when using just one machine.

A change to team working would imply job enlargement for machinists, who would need to be trained so that they were multi-skilled in different parts of the production process. They could then perform the roles of other members of their team, to ensure that there were no bottlenecks in production.

The cost of reorganisation and the costs of training the machinists should be outweighed by the resulting improved efficiency and flexibility of production. In this way, there is more focus on the outcome (goods of the correct quality produced on time) and less focus on the individual tasks within the process, which is a key principle of BPR.

Production teams are responsible for quality

Cuthbert's brand has a strong reputation, and the use of its products for protection in harsh environments and by the armed forces means that quality is a key element of customer satisfaction. Cuthbert must be able to manufacture goods which are free of defects, unlike the emergency order for the Ceeland army.

Reorganising the production into teams of machinists, sometimes known as production 'cells', would make machinists responsible for decisions about quality of a particular product type. This should lead to improvements in quality and therefore to meeting the needs of the customer.

Reducing the number of processes for checking is typical of a reengineered process, and the quality checking currently performed by the supervisors would no longer be necessary. The production teams will be managing themselves in this respect, and the distinction between supervisors and machinists will be removed, which is again typical of organisations which have undergone BPR.

Encouraging machinists in each team to suggest improvements in the production process should bring about improvements in both quality and efficiency, and hence a reduction in costs. It is the machinists who are closest to the production process and may be able to see how it can be improved. Cuthbert could also consider a more formal system of incremental continuous improvements such as Kaizen costing.

Tracking with RFIDs

Typically, organisations with reengineered processes end up having a flatter hierarchy. It seems that the supervisors' current roles will no longer be required if the proposal is adopted. Quality checks will no longer be undertaken by them, nor will recording of batches, which will become automated using RFID tags. This should save salary costs and improve lines of communication in the business.

The use of RFID tags would capture the information required to manage the production process at source, and there would be no distinction between the gathering of information and processing it. This is in contrast to the current system of inputting batch data into a spreadsheet, and is a feature in organisations which have undergone BPR.

Practical and cultural aspects of the proposal

New performance measures related to quality rather than just quantity produced will have to be developed and processes and systems developed in order to record and report these. New rewards systems will also have to be developed and introduced as a result of the changes proposed.

The proposal by definition represents a significant cultural change for Cuthbert, and may meet resistance by staff who may perceive it is a threat and a one-off cost cutting measure rather than a fundamental long-term change in the business. It will also impact the organisational hierarchy, relationships between employees and the roles within Cuthbert. There will be significant costs with training staff and with the disruption the transition may cause.

(b) The current reward system

The machinists are currently paid a basic hourly wage plus an amount depending on how many items they sew. This will encourage them to work quickly, which will reduce product costs. However, as they are not directly rewarded for the quality of the work which they produce, they may not be motivated to produce high quality work. Furthermore, in order to work quickly, machinists prefer to work on only one type of machine. This reduces Cuthbert's overall flexibility to respond to customer needs such as with failure to deliver the emergency order for the Ceeland army.

The production supervisors also receive a bonus according to how many items machinists in their team are able to sew. This too does not reward the production of high quality work, and supervisors may also neglect quality in order to increase the speed of production. The machinists in their teams could also see it as unfair that the supervisors obtain a bonus based on what they see as their efforts.

The production manager does not receive a bonus for production or quality. It seems that he has currently no direct motivation to improve on either of these two aspects of the process.

At 5% of salary, the bonus related to Cuthbert's overall profits is relatively small and it is unclear whether it is a significant motivator to any of the employees. Furthermore, machinists in particular may perceive their own efforts as too remote from the company's overall profit for them to bother to achieve it. Even if they were to be motivated by this, it is unclear what proportion of the total costs are related to direct labour as Cuthbert incurs many other costs such as advertising to maintain the brand. If the costs of direct labour were relatively low, even a large improvement in production efficiency by the machinists may have little effect on overall profit.

Under the new proposal

The existing reward systems would likely need to change if the move to team-based production were to be adopted.

It may still be appropriate to reward machinists with volume related bonuses, but as they worked in teams, a team-based performance bonus would be more appropriate. In that way the rest of the team would ensure that any underperforming machinists would improve their performance.

Rewards based on other factors such as quality, innovation, on time delivery and the ability to work as part of a team would also be appropriate and consistent with the machinists' enlarged job role. This would be a significant change for Cuthbert, where machinists are now being encouraged for the first time to bring about improvements in the production process. Rewards based on direct costs of production, or for the number of suggestions made by each machinist may be appropriate here.

New performance measures would need to be developed against which to align rewards to ensure that employees work towards the overall objectives of the organisation. New reporting systems will need to be put in place to feedback information

regarding quality to each cell. This may incur additional costs in the development of existing or new information technology systems.

The commitment of senior management to these changes would be required, as well as communication and training of employees at all levels. This may again incur additional costs and divert management time away from existing activities.

3 (a) (i) Implementation of ABC

ABC is an alternative to absorption costing, which is the method currently used by Dibble. ABC is a detailed fact gathering and data analysis technique.

In order to implement ABC production, overheads need to be grouped into cost pools as in the analysis of production overheads for Dibble in the management accounts extracts.

Then cost drivers for each cost pool must be identified. Cost drivers are the activities which bring about the costs, for example, the set up of the CAM machinery in Steel Division will be driven by the number of batches of production.

Once the cost pools and their associated cost drivers have been established, the cost per unit of cost driver can be calculated for each individual activity. The overhead costs are absorbed into each unit based on how much of the activity the unit uses, therefore, for example, units which require more inspection and testing will be allocated more of those costs. The overhead costs are then added to the prime costs in order to calculate the full cost of production.

(ii) Appropriateness of ABC

ABC is especially useful where there is a wide range of complex products and where production overheads form a larger proportion of total production costs. In Steel Division, there is a large range of products, many of them bespoke or one-off designs. Production overheads form 28% ($4,472 / (20,605 - 4,533)$) of total production costs, and the use of ABC will be appropriate in this division.

ABC enables a more accurate cost of production to be calculated, which is very useful in setting product prices. This could be especially useful in Steel Division which has a wide range of products subject to a number of manufacturing processes. It will help to ensure that each product is priced high enough in order to produce an acceptable margin, but not so high so as to become uncompetitive. This is especially important as Steel Division's strategy is to produce bespoke products at prices comparable to competitors who produce simpler, more conventional products.

ABC enables managers to determine what activities drive the costs, and so focus on reducing those activities to control costs. Not all production overheads, for example, inspection costs of the coatings in Steel Division, are related to production volumes. It is equally possible to apply ABC techniques to overheads other than production overheads.

Problems with ABC

ABC is less useful in businesses such as Timber Division where there is a small range of relatively simple products and where production overheads only comprise around 1% of total production costs. Of the production overheads in Timber Division, storage is by far the biggest and is likely to be driven by production volumes.

It may be difficult to determine what the drivers of production costs are. Storage costs could also be related to the insolvency of a customer. It may be impossible to allocate all overheads to the specific activities which drive them and so management will have to apply judgement.

Calculation of ABC may be time consuming, complex and poorly understood by managers. As such, the time and expense of doing so may not be justified. This appears to be the case in Timber Division where there are only a few, relatively simple products and few production overheads. Whereas in Steel Division, where there is a wide range of more complex products and a high proportion of production overheads, ABC is more appropriate than the traditional absorption costing method currently used at Dibble.

- (b) ABM is the use of ABC methods in order to improve organisational performance by meeting the needs of customers using the lowest possible amount of resources or costs. ABM can be applied at the operational level or to help develop strategy.

Product pricing

By accurately determining the cost of each product using ABC, Dibble would be able to ensure that prices are set so as to achieve an acceptable margin and also remain competitive with the prices currently charged in the rest of the market.

Steel Division charges customers a standard mark up of 10% on top of the \$650k subcontractors costs for the coating and painting of the steel. This means that customers are only being charged \$65k whereas the costs of storage of goods awaiting subcontract work and of transporting the goods to the subcontractor total \$695k.

By identifying the cost pools relating to the subcontract work, Steel Division can determine that it is making a loss on the subcontract work as a whole. It could therefore adjust the price of painted and coated products to ensure that an acceptable contribution margin is achieved. This is an example of operational ABM. At the strategic level, this type of information could help Dibble decide which product types to develop or discontinue.

The same principle may also apply where ABC can be used to identify which types of customers are the most profitable. In that way, resources can be focused on retaining and managing these customer groups. Action can be taken by additional

advertising or product development in order to focus on these particular markets. By analysing customer profitability, it may be possible to reduce costs or increase revenue to make certain customer groups or product lines more profitable, both in the short and long term.

By identifying lines of business with poor profitability, Dibble could discontinue selling to particular customers, or selling particular products, if appropriate action could not be taken to improve profitability.

Analysis of activities

By analysing the activities which drive the costs, Steel Division could determine which activities may not be required or could be done in a more efficient way. It may be possible to introduce improvements in the short term, for example, changes in the production process which may improve efficiency. In the longer term, strategic changes could be made to the way in which activities are undertaken, such as by outsourcing other activities in addition to the painting and coating which is currently outsourced.

Identifying the costs of transporting painted finished goods back from the subcontractors to Steel Division could lead them to evaluate ways to reduce this cost, for example, by despatching goods to customers directly from the subcontractors' premises. This is a non-value added activity, i.e. one which consumes resources, such as time and cost to transport goods to and from the subcontractors, but which is of no additional value to the customer. In contrast, ABM may help identify value adding activities, such as the coating and painting, which customers are prepared to pay for.

Of the five categories of production overheads, only machining time is a value adding activity, sometimes categorised as a primary activity. Setting up the CAM machinery is a secondary activity, which does not itself add value, but is required in order to perform a value adding activity (machining).

The other overheads, storage, transfer and inspection, are all non-value adding activities which should be eliminated or reduced. By identifying the activities which drive these costs managers can attempt to do this.

However, given the nature of Dibble's products, it is likely that some inspection will still be required for safety or commercial reasons, as shown by the litigation case relating to the faulty product. The production manager's proposal to increase the costs of inspection is inappropriate, as having identified inspection as a non-value adding activity, it would be better to focus attention on getting the product right first time.

Design improvements

Steel Division has a wide range of relatively complex or even bespoke products. ABM can help managers take decisions at the product design stage, where many of the product's costs are already committed. These can include using fewer or more standardised components, such as a more limited range of paints and coatings.

Where strategic decisions are being taken, for example, about new product lines or lines of business, such as with Steel Division's strategy to develop novel innovative products, ABM can help assess whether such developments are likely to be profitable at an early stage. This would help avoid development costs for products which could turn out to be unprofitable. This could also help allocate resources, such as capital investment, to the most profitable lines of business.

Performance measurement

For ABM to be successful, it will require the commitment of senior management and effective communication and training of employees at all levels in the organisation as to the benefits and methods of ABM. This will incur management time and cost, and divert attention from existing management activities.

New performance measurement systems will need to be developed. Employee rewards will need to be aligned to key performance measures, such as the reduction of non-value adding processes like inspection. This will ensure that employees work towards the objectives of the organisation. Additional information gathering systems, or adaptations to existing information systems, will also be required, which will again incur additional cost and may disrupt existing activities.

4 Tutor note: *The solution given is very detailed and candidates would not have to provide an answer of this length to score maximum marks. It is provided to give an idea of the scope of the relevant points which could have been made.*

- (a) Public sector organisations such as the Teeland universities receive all their funding from central government and do not have the generation of profit as an objective. Furthermore, their objectives such as 'improving the standard of education of the citizens of Teeland' cannot be measured in financial terms. The value for money of the universities can be assessed using the '3Es' framework of economy, efficiency and effectiveness.

Economy

This involves obtaining the inputs to the service at the lowest possible cost, while still maintaining the quality of the inputs. In practice, this may be difficult to do, and a reduction in cost may lead to a reduction in quality.

From the performance data given, the average annual payroll cost per member of academic staff is highest in Northcity University at \$62,286 (\$109m/1,750). This is 51% higher than Eastcity University, which has the lowest cost at \$41,237 of the four universities given. The high costs in Northcity University may reflect the fact that staff there may be more highly qualified or that highly skilled, trained staff are attracted to work there because of the high standards of teaching and academic research.

A higher payroll cost per member of academic staff may not necessarily mean a particular university is not giving good value for money. The relatively high salary costs in Southcity University of \$62,083 may simply reflect the higher costs of living in the capital city and so comparison between the regions may be inappropriate.

As such, there may be a conflict between this performance measure and the ability of the universities to achieve their objectives, such as to improve educational standards in Teeland. The politician's proposal to reduce salary levels for new recruits may reduce the number of appropriately qualified and skilled staff who wish to work there. This may reduce the standard of teaching and academic research, and as a result, the universities' performance against their stated objectives. This means that focusing solely on economy would not ensure the universities achieve value for money.

Efficiency

Efficiency measures the amount of outputs relative to the amount of inputs. The number of academic staff per student may be a suitable measurement but there may be differences between universities which would make it hard to compare results.

For example, there are 10.1 (17,600/1,750) students per member of academic staff in Northcity University, which is ranked number one in the Teeland government's provisional league table. There are 17.9 in Westcity University which is ranked much lower at 21. It would seem therefore, that increasing the number of students relative to the number of academic staff as per the politician's proposal may reduce the performance of the universities against their stated objectives and as such will not increase value for money.

The politician's comparison with the number of students per academic staff in neighbouring Veeland may not be appropriate. Whilst the politician's assertion that educational standards are higher in Veeland may be correct, the undertaking of high quality academic research may not be a key objective of the universities there, or the quality of research may be lower than in Teeland.

Effectiveness

Effectiveness measures whether the objectives of the organisation are being met. The stated objectives of the Teeland universities are to improve the overall standard of education of citizens in Teeland, to engage in high quality academic research and to provide well-qualified university graduates to meet the needs of the graduate jobs market in Teeland.

Objective to improve the overall standard of education in Teeland

Currently, there is no direct measure of the performance of the universities' stated objectives to increase the level of education of the citizens of Teeland. The number of graduates entering graduate jobs and the results of the TSOR survey may indirectly measure the effectiveness of the universities in achieving this aim. More direct measures such as the number of students completing their studies, or obtaining good results in university exams may be more appropriate.

The effectiveness of the universities in improving the standard of education should really be related to the entry requirements of each university. Westcity University is the lowest ranking of the four universities in the provisional league table and has the lowest proportion of graduates entering graduate jobs at 50% (1,750/(11,200/3.2)). It also receives the lowest amount of research funding per student at around \$1,250 (\$14m/11,200), but it has the lowest entry requirements, which have been relaxed to encourage students from a more diverse range of backgrounds to study there. Therefore, the improvement in educational standards relative to students' attainment on entry may be higher than the position in the league table may suggest.

Objective to engage in high quality academic research

The stated aim of the universities to engage in high quality academic research is also not currently measured. The amount of research funding received from government and other organisations by each university may indirectly reflect the quality of the research there as providers of funds for research would probably look to fund high quality research.

This measure may, however, equally reflect that some types of research are more expensive than others. Southcity University, which is successful in science and technology subjects, receives \$15,592 per student compared to \$5,000 in Eastcity, which specialises in arts and humanities subjects. The funding received may be more indicative of the past quality of academic research rather than future quality, or may not even reflect the quality of the research and may be high due to wastage or inefficiency. The definition of 'quality' of research is unclear.

Objective to meet the needs of the graduate jobs market

The number of graduates from each university obtaining graduate jobs each year is an indirect measure how well each university is achieving this objective. However, the number of graduate jobs filled may simply reflect the number of students at each university and demand for graduate jobs in the economy.

Many graduates, including the most talented of them, may take graduate jobs overseas. In which case, the measure of graduate jobs filled may not be a clear measure of the objective to meet the needs of the graduate jobs market in Teeland. A more precise measure of graduates entering graduate jobs in Teeland may be more appropriate. Even this may be misleading, if graduates later return from overseas to enter graduate jobs in Teeland.

The definition of what is a 'graduate' job is subjective and likely to change over time, for example, as a result of changes in the economy. This again limits the usefulness of this measure in determining whether universities have met this objective.

The TSOR survey is a measure of effectiveness reflecting a basket of measures, one of which is students' own perceptions of their future job prospects. The measures in the TSOR survey are, however, highly subjective according to individuals' personal perceptions, for example, about students' job prospects and the quality of teaching at the university. Furthermore, the survey

also covers a wider range of factors such as their overall satisfaction with university life. As such, this may not reflect the stated aims of the universities in Teeland. The TSOR score for Westcity University is considerably higher than for all the other universities, despite it having the lowest overall ranking.

(b) Effect of league tables on the quality of the Teeland universities

League tables encourage competition between universities

The publishing of league tables of the performance of the universities in Teeland should stimulate competition for high ranking between them. This should encourage them to find better ways to improve the quality of the service, achieve their performance objectives, and deliver greater value for money.

Sharing of resources may be discouraged

However, this may discourage knowledge or even resource sharing between the universities if they see themselves in competition for the best students and limited research funding. This could particularly be a problem if the university leaders were given performance targets and rewards based on their university's position in the league table. They may be encouraged to undertake 'gaming' and focus solely on their position within the league table to the detriment of other aspects of performance. This may mean the objectives for the universities overall in Teeland may not be achieved.

University leaders may focus on a narrow range of objectives

Students' overall experience of university life may be influenced by access to social, pastoral and sporting facilities. Management time and resources may be diverted away from these important areas by focusing on a narrow range of performance objectives such as improving educational standards and high quality research in order to boost the position in the league table.

Use of league table to ensure accountability of the universities

If the performance league tables are made publicly available, for example, on the internet as they are in Veeland, this should ensure the performance of the universities is transparent. This will mean that they are held accountable by the public for the quality of service and value for money which they provide.

League tables give choices to students and staff

To be really effective, league tables should provide users of the performance data, such as the public, with the ability to make choices based on the data given. Prospective students and staff will be able to make choices about which university to study or work at according to their position in the league tables. In addition, providers of funding such as the government will be able to identify where corrective action or additional funding may be required.

This could also be a disadvantage of using league tables, as the best students are likely to be attracted to the best universities, which are in turn likely to attract the most funding for academic research. This may cause a reduction in the overall performance of lower ranking universities, and therefore a failure of the universities as a whole to achieve the stated aim of improving educational standards in Teeland.

League tables may not reflect variation of standards at each university

There may also be considerable variation of the standards within one university, which a ranking in a league table will not address. For example, Southcity University offers courses in a variety of subjects and is particularly successful at science and technology subjects. This may mean that it achieves a high overall ranking in a league table, whereas its performance in other subjects may be weaker. For all of these reasons, the provision of league tables or performance data at a lower level, such as by subject area, may therefore be a better way to make the universities accountable to the public.

Regions may not be directly comparable

There may be inherent differences between universities which make comparison using league tables misleading or of limited value. For example, Eastcity University specialises in teaching arts and humanities. It may be inappropriate to compare it to universities offering a wide range of courses or specialising in science and technology subjects. Similarly, it may be misleading to compare universities of different sizes or in locations in different parts of Teeland. Universities which also attract students from outside Teeland, for example, those in capital or major cities, are likely to have more access to the most able students.

Due to its capital city location, Southcity University may incur additional costs of providing facilities and have to pay staff more to reflect the higher cost of living there. It may be more appropriate to produce league tables at a lower level, like within individual cities, to make the comparisons more meaningful and eliminate the effect of regional variations such as this.

There may be differences in the way different universities collect and report performance data. These problems can be reduced by the use of consistent and enforced policies for compiling performance data.

Resources required to produce league tables

Other problems relate to the targets chosen, external influences on results and cost of collating and measuring performance for the league table.

In Veeland, there is a sizeable government department dedicated to measuring performance. The cost of collecting performance data and compiling the league tables may therefore outweigh the benefits to be gained from doing so. It will use up resources which could be used, for example, in providing additional funding to the universities themselves.

Performance measures used to create league tables may be confusing and conflicting

By having a large number of targets such as in Veeland, this may cause confusion to managers, who may not know which to focus on. Similarly, it may be difficult to decide which performance measures are the most important.

Many performance measures chosen are likely to conflict. Reducing the salaries paid to academic staff may make it harder to recruit and retain experienced and well-qualified staff, which may lead to failing to meet the universities' key objectives. Similarly, increasing the number of students per member of academic staff is unlikely to help achieve any of the universities' objectives as staff will have less time available for teaching and for engaging in high quality research.

The use of league tables may demotivate staff and students

The Teeland politician's proposed target of a 5% annual increase in the number of students entering graduate jobs sounds very challenging and may be unrealistic. This will be especially so if accompanied by a reduction in the number of academic staff and a reduction of the salaries of new recruits. If the targets are felt to be unachievable by the university leaders, they may become demotivated, and give up on trying to achieve them altogether. This will especially be the case if this is an 'all or nothing' target. A more realistic target may at least ensure that some progress is made.

Students may also become demotivated if their university ranks poorly in league tables, even if the students themselves are satisfied with the standard of education they are receiving.

Similarly some performance measures, such as the number of students entering graduate jobs, which may be highly dependent on the economic conditions in Teeland, are not entirely under the control of the university leaders. The economic conditions in Teeland will be a key factor in determining the number of graduate jobs available there. University leaders may become demotivated by this measure as well and stop trying to improve.

The relative importance of different performance measures is subjective

The weighting of the different performance measures used by the Teeland government in arriving at the provisional ranking of the universities is subjective. It is difficult to determine which measures are the most important, and hence how each should be weighted. The opinions of different stakeholders on which are the most important measures will also vary. Academic staff and students may view different measures as important compared to the providers of finance (the Teeland government) and organisations who recruit university graduates.

Determining the relative importance of different performance measures in order to publish a league table is therefore difficult. Furthermore, the measures chosen, and their relative weightings, could differ from those in other countries. This would make it difficult to benchmark performance against universities in other countries, such as Veeland.

Total 25 marks

Professional Level – Options Module

Advanced Performance Management

September/December 2016 – Sample Questions



Time allowed: 3 hours 15 minutes

This question paper is divided into two sections:

Section A – This ONE question is compulsory and **MUST** be attempted

Section B – TWO questions **ONLY** to be attempted

Present Value and Annuity Tables are on pages 12 and 13.

Do NOT open this question paper until instructed by the supervisor.

This question paper must not be removed from the examination hall.

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Think Ahead

ACCA

The Association of
Chartered Certified
Accountants

Section A – This ONE question is compulsory and MUST be attempted

- 1 Monza Pharma (Monza) is a developer and manufacturer of medical drugs, based in Beeland but selling its products all over the world. As a listed company, the overall objective of the company is to maximise the return to shareholders and it has used return on capital employed (ROCE) as its performance measure for this objective. There has often been comment at board meetings that it is good to have one, easily-understood measure for consideration.

The company has three divisions:

- the drug development division develops new drug compounds, taking these through the regulatory systems of different countries until they are approved for sale;
- the manufacturing division then makes these compounds;
- the sales division then sells them.

Monza's share price has underperformed compared to the market and the health sector in the last two years. The chief executive officer (CEO) has identified that its current performance measures are too narrow and is implementing a balanced scorecard (BSC) approach to address this problem. The current performance measures are:

- Return on capital employed
- Average cost to develop a new drug
- Revenue growth

The CEO engaged a well-known consulting firm who recommended the use of a BSC. The consultants began by agreeing with the board of Monza that the objective for the organisation's medium-term strategy was as follows:

- Create shareholder value by:
 - Innovating in drug development
 - Efficiency in drug manufacturing
 - Success in selling their products

The consulting firm has presented an interim report with the following proposed performance measures:

- | | |
|------------------------------|--|
| – Financial: | ROCE |
| – Customer: | Revenue growth |
| – Internal business process: | Average cost to develop a new drug |
| – Learning and growth: | Training days provided for employees each year |

The CEO and the lead consultant have had a disagreement about the quality and cost of this work and as a result the consultants have been dismissed. The CEO has commented that the proposed measures lack insight into the business and do not appear to tackle issues at strategic, tactical and operational levels.

The CEO has decided to take this work in-house and has asked you as the performance management expert in the finance department to assist him by writing a report to the board to cover a number of areas. First, following the disagreement with the consultants, the CEO is worried that the consultants may not have been clear about the problems of using the BSC in their rush to persuade Monza to use their services.

Second, he wants you to evaluate the choice of performance measures currently used by Monza and those proposed by the consulting firm.

Third, there has been a debate at board level about how ROCE should be calculated. The marketing director stated that she was not sure what profit figure (of at least four which were available) should be used and why, especially given the large variation in result which this gives. She also wondered what the effect would be of using equity rather than all capital to calculate a return on investment. Some basic data has been provided in Appendix 1 to assist you in quantifying and evaluating these possibilities.

In addition to these concerns, the board is considering introducing a total quality management approach within Monza. Obviously, quality of output is critical in such a heavily regulated industry where the products can be a matter of life and death. There has been discussion about testing this idea within the manufacturing division. The CEO wants to understand, first, the costs associated with quality issues within that division. To aid your analysis, he has supplied some detailed information in Appendix 2. Next, the board requires an outline evaluation of how a total quality management (TQM) approach would fit within the manufacturing division.

Finally, the drug development divisional managers have been lobbying for a new information system which will assist their research chemists in identifying new drug compounds for testing. The new system will need to be capable of performing calculations and simulations which require high computational power and memory but will also need to have access to external data sources so that these scientists can keep up with developments in the field and identify new opportunities. The CEO is worried about the cost of such a new system and wants to know how it would fit within the existing lean management approach within that division.

Required:

Write a report to the board of Monza to:

- (i) **Assess the problems of using a balanced scorecard at Monza.** (8 marks)
- (ii) **Evaluate the choice of the current performance measures and the consulting firm's proposed performance measures for Monza.** (12 marks)
- (iii) **Evaluate the effect of choosing different profit and capital measurements for different measures of return on investment and recommend a suitable approach for Monza.** (11 marks)
- (iv) **Analyse the current quality costs in the manufacturing division and then briefly discuss how implementation of total quality management would affect the division.** (10 marks)
- (v) **Briefly advise on how the drug development division can aim to make the new information system 'lean'.** (5 marks)

Professional marks will be awarded for the format, style and structure of the discussion of your answer.

(4 marks)

(50 marks)

Appendix 1

Financial data for Monza for the most recent accounting period

	\$m
Revenue	8,001
Costs	<u>2,460</u>
Gross profit	5,541
Other costs	3,248
Restructuring costs	<u>482</u>
Operating profit	1,811
Finance costs	<u>266</u>
Profit before tax	1,545
Tax	<u>419</u>
Profit after tax	<u>1,126</u>

Capital structure from the statement of financial position

Shareholders' equity	1,161
Long-term debt	8,739

Note: Restructuring costs relate to a major project which completed during the period.

Appendix 2

Cost information for the manufacturing division for the most recent accounting period

1. Batches rejected at factory valued at \$17m which have a scrap value of \$4m.
2. Training of factory staff which cost \$8m.
3. Regulatory fines costing \$5m (due to drug compounds being outside the specified range of mix of chemical

ingredients).

4. Discounts given following customer complaints due to late delivery costing \$22m.
5. Factory product testing department cost \$12m.
6. Cost of raw materials was \$1,008m.

Section B – TWO questions ONLY to be attempted

- 2** Framiltone is a food manufacturer based in Ceeland, whose objective is to maximise shareholder wealth. Framiltone has two divisions: Dairy division and Luxury division. Framiltone began manufacturing dairy foods 20 years ago and Dairy division, representing 60% of total revenue, is still the larger of Framiltone's two divisions.

Dairy division

This division manufactures cheeses and milk-based desserts. The market in Ceeland for these products is saturated, with little opportunity for growth. Dairy division has, however, agreed profitable fixed price agreements to supply all the major supermarket chains in Ceeland for the next three years. The division has also agreed long-term fixed volume and price contracts with suppliers of milk, which is by far the most significant raw material used by the division.

In contrast to Luxury division, Dairy division does not operate its own fleet of delivery vehicles, but instead subcontracts this to a third party distribution company. The terms of the contract provide that the distribution company can pass on some increases in fuel costs to Framiltone. These increases are capped at 0.5% annually and are agreed prior to the finalisation of each year's budget.

Production volumes have shown less than 0.5% growth over the last five years. Dairy division managers have invested in modern production plant and its production is known to be the most efficient and consistent in the industry.

Luxury division

This division was set up two years ago to provide an opportunity for growth which is absent from the dairy foods sector. Luxury division produces high quality foods using unusual, rare and expensive ingredients, many of which are imported from neighbouring Veeland. The product range changes frequently according to consumer tastes and the availability and price of ingredients. All Luxury division's products are distributed using its own fleet of delivery vehicles.

Since the company began, Framiltone has used a traditional incremental budgeting process. Annual budgets for each division are set by the company's head office after some consultation with divisional managers, who currently have little experience of setting their own budgets. Performance of each division, and of divisional managers, is appraised against these budgets. For many years, Framiltone managed to achieve the budgets set, but last year managers at Luxury division complained that they were unable to achieve their budget due to factors beyond their control. A wet growing season in Veeland had reduced the harvest of key ingredients in Luxury's products, significantly increasing their cost. As a result, revenue and gross margins fell sharply and the division failed to achieve its operating profit target for the year.

Framiltone has just appointed a new CEO at the end of Q1 of the current year. He has called you as a performance management expert for your advice.

'In my last job in the retail fashion industry, we used rolling budgets, where the annual budget was updated to reflect the results of every quarter's trading. That gives a more realistic target, providing a better basis on which to appraise divisional performance. Do you think we should use a similar system for all divisions at Framiltone?', he asked.

You have obtained the current year budget for Luxury division and the division's Q1 actual trading results (Appendix 1) and notes outlining expectations of divisional key costs and revenues for the rest of the year (Appendix 2).

Appendix 1

Luxury division current year budget

C\$'000	Q1	Q2	Q3	Q4	Total	Q1 Actual
Revenue	10,000	12,000	11,000	7,000	40,000	10,400
Cost of sales	(6,100)	(7,120)	(6,460)	(4,720)	(24,400)	(6,240)
Gross profit	3,900	4,880	4,540	2,280	15,600	4,160
Distribution costs	(600)	(720)	(660)	(420)	(2,400)	(624)
Administration costs	(2,300)	(2,300)	(2,300)	(2,300)	(9,200)	(2,296)
Operating profit	1,000	1,860	1,580	(440)	4,000	1,240

Appendix 2

Expected key costs and revenues for remainder of the current year

1. Sales volumes are expected to be 2% higher each quarter than forecast in the current budget.
2. Average selling price per unit is expected to increase by 1.5% from the beginning of Q3.
3. The exchange rate between the Ceeland Dollar (C\$) and the Veeland Dollar (V\$) is predicted to change at the beginning of Q2 to C\$1.00 buys V\$1.50. For several years up to the end of Q1, C\$1.00 has been equivalent to V\$1.40 and this exchange rate has been used when producing the current year budget. Food produced in the Luxury division is despatched immediately upon production and Framiltone holds minimal inventory. The cost of ingredients imported from Veeland represents 50% of the division's cost of sales and suppliers invoice goods in V\$.
4. The rate of tax levied by the Ceeland government on the cost of fuel which Luxury uses to power its fleet of delivery vehicles is due to increase from 60%, which it has been for many years, to 63% at the beginning of quarter 3. 70% of the division's distribution costs are represented by the cost of fuel for delivery vehicles.
5. The CEO has initiated a programme of overhead cost reductions and savings of 2.5% from the budgeted administration costs are expected from the beginning of Q2. Q3 administration costs are expected to be a further 2.5% lower than in Q2, with a further 2.5% saving in Q4 over the Q3 costs.

Required:

- (a) Using the data in the appendices, recalculate the current year budget to the end of the current year and briefly comment on the overall impact of this on the expected operating profit for the year. (12 marks)
- (b) Evaluate whether a move from traditional incremental budgeting to a system of rolling budgets would be appropriate for Dairy and Luxury divisions. (13 marks)

(25 marks)

- 3 Alflonnso is a large producer of industrial chemicals, with divisions in 25 countries. The agrochemicals division produces a chemical pesticide, known internally as 'ALF', to control pests in a crop which is of worldwide significance, economically and for food production. Pesticides such as ALF only remain effective for a limited time, after which pests become resistant to them and a replacement product needs to be found. A scientific study has shown that the current variant, ALF6, is becoming ineffective in controlling pests and in some places, it has accumulated in the soil to levels which may significantly reduce crop yields in the future if it is continued to be used. The agrochemicals division is evaluating three new products to find one replacement for ALF6.

ALF7

ALF7 is produced by a small chemical modification to the existing product and requires little research and development (R&D) resources to develop it. As it is closely related to the current variant, it is only expected to remain effective, and in use, for three years. It is unclear whether ALF7 will accumulate in the soil in the same way as ALF6 does.

Red

Red is a new type of pesticide which will incur large amounts of R&D expenditure to develop a commercial version.

In addition, the agrochemicals division will have to fund a long-term scientific study into the effect of Red on the environment at a cost of \$4m for each of the 15 years that the product will be in use, and for five years afterwards.

Production of Red generates large amounts of toxic by-products which must be treated in the division's waste treatment facility. The production plant used to produce Red must also be decommissioned for cleaning, at an estimated cost of \$45m, at the end of the life of the product.

Green

Green is a form of a naturally occurring chemical, thought to be safe and not to accumulate in the environment. It is expected to remain in use for eight years. Production of Green requires relatively large amounts of energy. Significant R&D expenditure is also needed to produce an effective version, as Green remains active in the environment for only a short time. Because of this, Green is unsuitable for use in climates where crop production is already difficult.

The Global Food Production Organisation (GFPO) is a non-governmental organisation which funds new ways to increase global crop production, especially in regions where food for human consumption is already scarce. The GFPO has agreed to make a significant contribution to the R&D costs of producing a replacement for ALF6, but will be unwilling to contribute to the R&D costs for Green because it cannot be used in every region. Similarly, a number of governments, in countries where Alflonnsö has licences to operate its other chemical businesses, have warned the company of the potential public disapproval should the agrochemical division choose to replace ALF6 with a product unsuitable for use in areas where food production is scarce.

The newly appointed chief financial officer (CFO) for the agrochemicals division has asked you as a performance management consultant for your advice. 'One of our analysts in the agrochemicals division', she said, 'has produced a single period statement of profit or loss (Appendix 1) to show the profitability of the three new products we are considering as replacements for ALF6.'

'I think the analyst's calculations are too simplistic', she continued. 'The costs of the waste treatment are apportioned based on the expected revenue of the new products. This is consistent with Alflonnsö's traditional group accounting policy, but I don't think this gives an accurate costing for the new products. Also, I watched a presentation recently about the use of lifecycle costing and also how environmental management accounting (EMA) can help reduce costs in the categories of conventional, contingent and reputation costs and as a result improve performance.'

Appendix 1

Single period statement of profit or loss for the replacement products for ALF6¹

	ALF7	Red	Green
Revenue per litre (\$)	8.00	13.00	11.00
Quantity sold and produced (million litres)	100	85	75
	\$m	\$m	\$m
Revenue	800	1,105	825
Direct material, labour and energy	(524)	(724)	(565)
Factory overheads	(80)	(122)	(74)
Environmental study	–	(4)	–
Waste treatment of toxic by-products ²	<u>(54)</u>	<u>(63)</u>	<u>(71)</u>
Net profit ³	<u>142</u>	<u>192</u>	<u>115</u>
Average profit per litre (\$)	1.42	2.26	1.53

Notes to the statement of profit or loss:

¹ – All figures exclude the contribution from the GFPO towards the R&D costs of the new product.

² – Waste treatment is an overhead cost incurred in the division's waste treatment facility. Currently, costs of waste treatment are apportioned to products according to expected revenue. The total annual cost of the waste treatment facility, which processes a total of 55m litres of waste each year, is \$300m. Any waste treatment capacity not used by any of the three new products can be used to treat waste created during the manufacture of other products in the division. One litre of waste by-product is produced for every 12.5 litres of ALF7 produced, for every 2.5 litres of Red produced and for every 100 litres of Green.

³ – R&D costs are incurred in the division's R&D facility. In accordance with the group's accounting policy, R&D expenditure is not currently apportioned to individual products. The annual cost of the R&D facility is \$60m and has

a total of 30,400 R&D hours available, of which 800 hours would be required to develop ALF7, 8,500 hours to develop Red, and 4,000 hours to develop Green.

Required:

- (a) (i) Explain how activity based costing may help the agrochemicals division in assessing the profitability of the three new products. (5 marks)
- (ii) Using activity based costing, and excluding the value of the grant from the GFPO, calculate the total R&D costs and waste treatment costs of the three new products. (3 marks)
- (b) Using your answers from part (a) (ii), calculate the average net profit per litre of each of the three alternative new products over their expected lifecycles and comment on the results. (9 marks)
- (c) Advise how environmental management accounting (EMA) may help improve the performance of the agrochemicals division. (8 marks)

(25 marks)

- 4 Laudan Advertising Agency (LAA) is based in Geeland and has three autonomous subsidiaries: A, B and C. All three subsidiaries are profit centres and LAA seeks to maximise the long-term wealth of its shareholders. A is based in Geeland, while both B and C are located in other parts of the world. LAA is a highly respected advertising agency, which in the last five years has created advertising campaigns for 25 of the world's top 100 most recognised brands. LAA's four key objectives published on its website are:

- To delight our clients by the quality of our work
- Provide excellent value for money to our clients
- Give our clients access to specialist and local knowledge
- Ensure our clients return to us time after time

There are three main functions within LAA:

1. Campaign management, which involves researching and understanding clients' requirements and budgets and designing a suitable advertising campaign for them.
2. Creative design, which is where the visual appearance of the advert and graphics are created.
3. Media buying, which negotiates prices with, and buys advertising time and space from, magazine and newspaper publishers, internet search engines and TV companies.

Each subsidiary has its own department for campaign management and for media buying. Only A, however, has a creative design department.

The directors at LAA believe that without visually appealing design, any advertising campaign is unlikely to be successful and meet the expectations of the client. They identified the importance of being able to produce high quality creative design as a critical success factor for the business. Two years ago, they decided to concentrate all of LAA's creative design at a 'centre of design excellence' within A. The intention was to improve the quality of creative design within the business by giving staff access to the latest design technology, and by attracting the most talented designers to work there.

To encourage the three subsidiaries to use the internal creative design department within A, instead of external third party design agencies, the directors created a new additional key performance indicator on which to appraise the performance of all subsidiaries and of subsidiary managers:

- All subsidiaries, including A, must purchase at least 90% of creative design work internally from A.

Prior to the introduction of this performance indicator, 40% of creative design work in each of the three subsidiaries was purchased from external design agencies.

The directors of LAA have become concerned that the introduction of the new key performance indicator may be causing managers to operate in ways which are not helping to meet LAA's stated objectives. They have asked for comments from subsidiary managers (Appendix 1) about whether they have met the 90% target in the most recent

period and if not, to explain why this is.

Appendix 1

Subsidiary managers' comments on achievement of KPI for 90% creative design work purchased internally

Subsidiary A

'A purchased 86% of design work from our internal design department in the period. It would have been almost 100%, but we won a large order for a new client who operates in a specialised industry of which we have no experience. As a result, we had to use the services of a specialised external design agency, which was much more expensive than using our in-house team.'

Subsidiary B

'B purchased 62% of design work internally in the period. Though the quality of the designs is very good, they were more appealing to consumers in Geeland than here in Veeland, where B operates. The internal design department did not seem to understand consumer preferences in Veeland, and many of their designs were rejected by a key client of ours. As a result, an important advertising campaign missed key deadlines, by which time the internal design department had insufficient capacity to finish the work and we had to use an external agency.'

'As there is no formal transfer pricing policy in place at LAA, the basis of the transfer price charged by the internal design department is also unclear to us. It appears to be based on full cost of the design work, including apportioned

overheads and an allowance for bad debts and marketing expenses, plus a very substantial mark up. We have spent a long time trying to negotiate this price with A, which is much more expensive than external designers. Furthermore, we are currently being investigated by the tax authorities here in Veeland who have indicated that the prices charged by A for design do seem well in excess of market rates.'

Subsidiary C

'C purchased 91% of design work from the internal design department in the period, as well as achieving all our other performance targets. A key client of ours ran a major advertising campaign during the period. We used the internal design department for the first time for this campaign, instead of the usual external agency that we have used in the past for work for this client. The client was very unhappy with the extra cost that this incurred, as the number of design hours and the hourly rate was much higher than for previous campaigns. The internal design department refused to reduce the price after long negotiations and we had to give a large discount to the client before they would settle our invoice. As a result, our gross profit margin for the period was significantly reduced.'

'It would be much fairer if the transfer price charged by A was based on the market price of the services provided.'

Required:

(a) Evaluate how the following help LAA to manage performance in order to achieve its stated objectives:

- (i) identifying the critical success factor of producing high quality creative design, and**
 - (ii) setting the key performance indicator for the requirement to purchase 90% of design work internally.**
- (8 marks)**

(b) Assess the need for a formal transfer pricing policy at LAA.

(9 marks)

(c) Advise the directors whether LAA should use a market value transfer price as suggested by the manager of subsidiary C.

(8 marks)

(25 marks)

Answers of Above Question Paper

Professional Level – Options Module, Paper P5
Advanced Performance Management

September/December 2016 Sample Answers

1 Report

To: The board of Monza

From: A. Accountant

Date: September 2016

Subject: Performance measurement and management issues at Monza

This report addresses the problems of using the balanced scorecard within Monza. The current and proposed performance measures are evaluated and the main current measure is discussed in detail. Quality costs and the new quality programme at the manufacturing division are analysed. Finally, the lean philosophy is applied to the new information system for the drug development division.

(i) Problems with using the balanced scorecard

The balanced scorecard (BSC) provides no aggregate or single summary measure of performance unlike the value-based approach. Also, there is no simple, direct link between shareholder value, the main objective of Monza, and the balanced scorecard measures.

The measures in the scorecard can conflict, for example, cost controls (financial perspective) can obstruct the investment needed in order to speed up manufacturing processes (internal business perspective). Overall, the measures should seek to align with the fundamental need to create shareholder value.

It can be difficult to select measures. In particular, there is the danger of losing sight of key information in a plethora of indicators. This may be an issue for Monza as it has only had three indicators in the past and this will now increase significantly (a potential of 12, if there is one for each level of management in the four perspectives).

There must be management commitment to the change to the scorecard. In particular, there must not be a return to a focus on the financial measures which have been used in the past at Monza. Management should acquire the expertise for understanding non-financial measures through training.

There are potentially significant costs in collecting the additional information which will be needed for the new performance measures. Many of the measures will be non-financial and so new information systems will be required to collect and record the data.

(ii) Choice of current and proposed performance measures

Current measures

The current measures are all historic, financial ones and so the BSC approach will bring a longer term view by using non-financial measures which consider those factors which might drive future growth, for example, those in the learning and growth perspective. The current measures do not directly link to shareholder value which appears to be the overall aim of the company. A measure such as economic value added would do this more effectively.

The three measures do give a broad view of financial performance. ROCE is a widely-used measure which it should be possible to benchmark against competitors. As far as the divisions are concerned, there is a measure of success in selling through revenue growth, though this may not be due to only the sales division but also the drugs brought to market by the development division. Average cost to develop a new drug is a financial measure of the development division's performance but this does not measure its aim of innovation in development. Indeed, this measure may conflict with that aim as cost control of development may hinder innovative thinking. It would appear more appropriate to have a cost control measure associated with manufacturing as its goal is to be more efficient. The performance of the manufacturing division is only measured indirectly through its effect on the financial performance of the company as a whole.

Consultants' proposed measures

The suggested measures do not seem to deviate much from the existing measures, though there may be an advantage in this as the new system would be using existing information systems and known measures in that case. However, this advantage is secondary to the need to find measures which will drive useful performance in the four perspectives.

The proposed measures from the consultants' interim report mostly fit within the standard four perspectives of the BSC, although revenue growth is more appropriate as a measure from the financial perspective. Customer perspective measures should focus on the strategies which will achieve success in the eyes of the customers rather than just measuring the results of those strategies. Examples of this would be measuring the efficacy of the drugs which are developed by Monza or the reputation of Monza's medicines among the medical community.

Taking the others in turn, ROCE does not seem to be directly linked to shareholder value as, for example, economic value added or net present value would be. ROCE considers the performance over the whole capital base while the shareholders will be more directly concerned with returns on their equity investment. As a profit-based measure, ROCE may also be failing to target cash-generation which is ultimately driving dividend payments and value creation for shareholders.

As already indicated, cost control in business processes is important but other measures of success such as time to market for the development of new products and quality initiatives should also be considered.

The fourth perspective is particularly relevant to a high-technology firm such as Monza. There will be considerable competitive advantage in having a highly skilled workforce, however, the measure proposed is imprecise as it values all training days, whether for knowledge workers or unskilled labourers, as equally valuable. Measures of the number of innovations within each division may be appropriate as these will be qualitatively different (new compounds developed, manufacturing quality improvements and sales techniques/initiatives developed).

Overall, the initial proposed set of measures does appear limited and does not address the overall aim of Monza or the problem of the narrowness of the existing set of measures.

(iii) Variation in calculating return on capital

Using	ROCE	ROE
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Operating profit	18%	
Operating profit before restructuring	23%	
Profit after tax		97%

Return on capital employed is normally calculated by dividing operating profit by capital employed (debt and equity). The calculations above illustrate the possibilities using the different return (profit) and capital figures available.

The ROCE figure should not use gross profit as this ignores the operating costs not directly attached to sales and at Monza these will include significant overheads from the drug development and manufacturing divisions which are relevant to overall performance. The return figure should match with the capital used to generate that return. As ROCE is calculated based on the return on total capital, it should not include financing costs and so profit before and after tax are not consistent with this view. The one area that could be argued is whether to include the one-off costs of restructuring in performance. It would probably be best to disclose both figures to the company's stakeholders and to identify how any competitor would perform such a calculation for benchmarking.

A suitable approach for Monza

Return on equity (ROE) may be a more suitable measure given Monza's focus on shareholder (not debt provider) performance. In this case, the relevant return figure is the profit after tax as this is the return available to shareholders after the debt providers have been paid. The figure here (97%) is very large. This is due partly to the fact that the capital figures used in these calculations are from the financial statements and are not market values. (Market values of equity and debt would give a more accurate measure of performance both for ROCE and ROE.) Another reason why the ROE is large compared to ROCE is that Monza is highly geared (88%). ROE, therefore, demonstrates the benefit of the chosen capital structure of Monza.

Overall, therefore, ROE is a better measure than ROCE as it fits with the prioritisation of shareholders as opposed to all capital providers.

(iv) Quality costs and total quality management at manufacturing division

Quality costs are usually broken into four categories:

- Prevention costs which relate to avoiding producing defective items in the first place;
- Appraisal costs which relate to ensuring that the products produced meet an acceptable standard;
- Costs of internal failure which relate to products which fail appraisal and how these are handled; and
- Costs of external failure which relate to products which fail the standard but are still shipped to customers.

At Monza, for the most recent period, the following quality costs have been identified:

Prevention costs – \$8m (training)

Appraisal costs – \$12m (product testing)

Costs of internal failure – \$13m (batches rejected)

Costs of external failure – \$27m = \$5m (fines) + \$22m (discounts for late delivery)

Total raw material costs might hide relevant quality costs if the company is buying higher quality material to prevent problems of quality, however, this cannot be quantified in this scenario.

It can be seen that there were \$40m of failure costs in the period but only \$8m was spent on prevention. A 10% improvement in the failures could generate \$4m in cost savings and the budget for improvements to production which prevent such failures could be significantly expanded in light of this. The analysis of quality costs should help to emphasise the importance of prevention by showing its financial value and this is vital to motivate a total quality management (TQM) approach.

Impact of TQM on manufacturing division

Total quality management focuses on the customer perspective and the need for each part of the organisation to avoid defects in the chain of production. Prevention is the key to improvement and so management should focus on avoiding defects through training and improved process design rather than appraisal. All employees must accept personal responsibility for their work and act to remove defects from production. Quality certification programmes are often instituted in order to encourage the focus on 'zero defects'. Quality circles may be formed as small, autonomous groups aimed at devising solutions to quality problems.

Making the new information system 'lean' in drug development division

Lean systems aim to get the right thing to the right place at the right time, first time. They aim to reduce waste while being flexible. The need for flexibility will be important for the drug development division as it is constantly working in a changing environment.

The information in the system should be organised so that it can be retrieved with minimum difficulty. The information will also have to be accurate so that time is not wasted in making errors. The information should be presented clearly and, in particular, should not be excessive given the needs of the users. The information should be able to be exchanged easily. This will be important in a collaborative environment such as a research group in the development division.

[Tutor note: The 5Ss (Structurise, Systemise, Sanitise, Standardise, Self-discipline) could also be used to structure an acceptable answer.]

C\$'000	Q1 (Actual)	Q2	Q3	Q4	Total
Revenue (W1)	10,400	12,240	11,388	7,247	41,275
Cost of sales (W2)	<u>(6,240)</u>	<u>(7,020)</u>	<u>(6,370)</u>	<u>(4,654)</u>	<u>(24,284)</u>
Gross profit	4,160	5,220	5,018	2,593	16,991
Distribution costs (W3)	(624)	(734)	(682)	(434)	(2,474)
Administration costs (W4)	<u>(2,296)</u>	<u>(2,243)</u>	<u>(2,186)</u>	<u>(2,132)</u>	<u>(8,857)</u>
Operating profit	<u>1,240</u>	<u>2,243</u>	<u>2,150</u>	<u>27</u>	<u>5,660</u>

Recalculating Luxury division's budget for the year to reflect current conditions gives a more realistic target for the division managers. For the coming year, the effect of this is very significant and represents a much more challenging target for managers as it increases the expected total annual operating profit by 42% (5,660/4,000) over the original budget.

Workings (C\$'000)

W1 – Revenue

	Q1 (Actual)	Q2	Q3	Q4	Total
Original budget	10,400·0	12,000·0	11,000·0	7,000·0	40,400·0
2% sales volume		240·0	220·0	140·0	600·0
1·5% sales price			<u>168·3</u>	<u>107·1</u>	<u>275·4</u>
Total	<u>10,400·0</u>	<u>12,240·0</u>	<u>11,388·3</u>	<u>7,247·1</u>	<u>41,275·4</u>

W2 – Cost of sales

	Q1 (Actual)	Q2	Q3	Q4	Total
Original budget	6,240·0	7,120·0	6,460·0	4,720·0	24,540·0
2% sales volume		142·4	129·2	94·4	366·0
6·67% Exchange rate*		<u>(242·2)</u>	<u>(219·7)</u>	<u>(160·6)</u>	<u>(622·5)</u>
Total	<u>6,240·0</u>	<u>7,020·2</u>	<u>6,369·5</u>	<u>4,653·8</u>	<u>24,283·5</u>

*6·67% = $1 - (1·4/1·5)$, applied to 50% of COS.

W3 – Distribution costs

	Q1 (Actual)	Q2	Q3	Q4	Total
Original budget	624·0	720·0	660·0	420·0	2,424·0
2% sales volume		14·4	13·2	8·4	36·0
1·31% Fuel tax increase*			<u>8·8</u>	<u>5·6</u>	<u>14·4</u>
Total	<u>624·0</u>	<u>734·4</u>	<u>682·0</u>	<u>434·0</u>	<u>2,474·40</u>

* 1·31% = $70\% \times (3/160)$

W4 – Administration costs

	Q1 (Actual)	Q2	Q3	Q4	Total
Original budget	2,296·0	2,300·0	2,300·0	2,300·0	9,196·0
2·5% compound savings		<u>(57·5)</u>	<u>(113·6)</u>	<u>(168·3)</u>	<u>(339·4)</u>
Total	<u>2,296·0</u>	<u>2,242·5</u>	<u>2,186·4</u>	<u>2,131·7</u>	<u>8,856·6</u>

Workings for savings in administration costs

Q2 $2,300·0 \times 2·5\% = 57·5$

Q3 $57·5 + (2,242·5 \times 2·5\%) = 113·6$

Q4 $113·6 + (2,186·40 \times 2·5\%) = 168·3$

Incremental budgeting

Framiltone currently uses this type of budgeting, the starting point of which is usually the previous year's actual performance or budget. This is then updated for any known changes in costs, or for inflation. The budget would normally remain unchanged for the remainder of the year.

Incremental budgeting is suitable for use in organisations which are stable and not undergoing significant changes. This is the case for Dairy division, which operates in a saturated market and has little opportunity to grow.

Production volumes in Dairy division have only increased by 0·5% over a full five years, so it is a very stable business. Dairy division has stability of both revenues and costs. It has long-term fixed cost and volume supply agreements with its supermarket customers. It also has similar fixed contracts with its suppliers of milk, the most significant raw material ingredient used in its products.

Though the third party distribution company is able to pass on some increases in fuel costs to Dairy division, these are capped

at only 0.5% per year. This is significantly less than the tax increases which will increase Luxury division's fuel costs after the start of Q3. It appears that Dairy division has relatively little exposure to rising fuel prices.

Furthermore, these increases are agreed prior to the setting of the current year budget, so there is no need to update these costs on an ongoing basis throughout the year.

As the dairy foods market is saturated and stable, there is little opportunity for the division to incur discretionary costs such as research and development of new products.

Incremental budgeting is only suitable for business where costs are already well controlled. This is because a big disadvantage of incremental budgeting is that it perpetuates inefficient activities by often simply building inflation into previous year results or budgets. It appears that Dairy division, having been in existence for a relatively long time, does have good cost control as it has modern production plant and is recognised as having the most efficient production processes in the industry.

Incremental budgeting may, however, build in budget slack. Managers may spend up to their budgeted amounts in one year, so that their budget is not cut the next, which may affect their appraisal and reward in the future. It is unclear whether this is occurring at Dairy division, though for many years (while Dairy division was the only division at Framiltone), the budgets set following consultation with divisional managers have just been achieved. This may be consistent with the stability of the division, but could also indicate that budgets were not set at a challenging enough level, even though Dairy division had the best performance of the two divisions last year.

It is not therefore advisable that rolling budgets are introduced in Dairy division, as the current incremental process appears satisfactory. This is especially so since divisional managers have little experience of setting their own budgets, and the time and cost of using rolling budgets would exceed the value of them to the division.

Rolling budgets

Rolling budgets are continually updated to reflect current conditions and are usually extended by budgeting for an additional period after the current period, for example, a quarter, has elapsed. That way, the budget always reflects the most up to date trading conditions and best estimates of future costs and revenues, usually for the next four quarters.

Rolling budgets are suitable for businesses which change rapidly or where it is difficult to estimate future revenues and costs.

Luxury division was only set up two years ago, and is therefore a relatively new business. It also operates in quite a different sector of the industry to that in which Dairy division operates and where Framiltone has most experience. There is likely to be considerable uncertainty as to future costs and revenues as Framiltone has little direct experience on which to base its forecasts.

Whereas Dairy division operates in a saturated and stable market, Luxury division uses rare ingredients which are subject to variations in availability and cost, for example, as a result of poor harvests. There is no indication that Luxury division has fixed price and volume contracts with its customers or suppliers and is therefore likely to suffer from instability of supply as well as demand resulting from changes in consumer tastes.

The frequent changes in the product range are also likely to make forecasting for a year ahead difficult. The fact that a large proportion of ingredients are imported from Veeland, makes costs susceptible to changes in the C\$:V\$ exchange rates which can quickly make an annual budget out of date, though managers may use methods such as forward contracts to reduce these movements. If managers are appraised on a budget which is out of date or unrealistic, they are likely to give up trying to achieve the budget, which will negatively affect the performance of Framiltone.

Rolling budgets will provide a more accurate basis on which to appraise managers at Luxury division as they incorporate the best known estimates of future costs and revenues. It can be seen by the recalculation following Q1 results that Luxury division's revised budgeted operating profit for the year has increased significantly by 42% (5,660/4,000), most of which is due to exchange rate changes. Where costs and revenues are likely to change during the period, rolling budgets give a much more realistic basis on which to appraise divisional performance and appraise and reward divisional managers. Budgets are likely to be achievable, which will motivate managers to try and achieve them.

Though the regular updating of the budget required in rolling budgeting is costly, time consuming and possibly a distraction for divisional managers, it does seem that rolling budgets are more suitable for Luxury division than the current incremental approach, particularly as being realistic and achievable, they will increase managers' motivation to achieve the budget and so improve the performance of the business.

3 (a) (i) Activity based costing

Activity based costing (ABC) allocates costs to products based on the activities which actually drive the cost to better allocate the costs.

At Alflonns, the group accounting policy is to allocate waste treatment overhead costs on the basis of revenue, which is arbitrary. From the analyst's calculations, R&D costs do not seem to be allocated to specific product costs at all. This may be appropriate elsewhere in the group, where different products may consume similar levels of overheads, but the three new products being evaluated consume quite different amounts of R&D and waste treatment overheads.

It is therefore inappropriate to charge these costs to the products on the basis of revenue. Charging these costs on the basis of the activities which drive them, which are research hours and volume of waste by-products for R&D costs and waste treatment costs respectively, will give a more accurate costing. This will provide a better basis on which to evaluate the new products and set appropriate prices.

(ii) Calculation of waste treatment cost

	ALF7	Red	Green
Quantity of waste by-product (m litres)	8.0	34.00	0.75
[m litres produced/no. of m litres to make 1 litre of waste]	[100/12.5]	[85/2.5]	[75/100]
Allocated total \$300m according to quantity of waste as proportion of total 55m litres:			
Annual waste treatment allocated (\$m):	43.6 [8 x 300/55]	185.5 [34 x 300/55]	4.1 [0.75 x 300/55]
R&D cost			
	ALF7	Red	Green
Allocated total \$60m according to required hours of research as proportion of total 30,400 hours:			
R&D treatment allocated (\$m):	1.6 [800 x 60/30,400]	16.8 [8,500 x 60/30,400]	7.9 [4,000 x 60/30,400]

(b) Average unit cost of each product over total lifecycle

\$m	ALF7	Red	Green
Revenue [given]	800.0	1,105.0	825.0
Direct material, labour and energy [given]	(524.0)	(724.0)	(565.0)
Factory overheads [given]	(80.0)	(122.0)	(74.0)
Waste treatment [from part (a) (ii)]	<u>(43.6)</u>	<u>(185.5)</u>	<u>(4.1)</u>
Total annual net profit	152.4	73.5	181.9
Lifecycle duration (years)	3	15	8
Total net profit over lifecycle (before other lifecycle costs)	457.2	1,102.5	1,455.2
Scientific study [\$4m x 20 years]	–	(80.0)	–
Decommissioning cost	–	(45.0)	–
R&D cost [from part (a) (ii)]	<u>(1.6)</u>	<u>(16.8)</u>	<u>(7.9)</u>
Total net profit over lifecycle	455.6	960.7	1,447.3
No. of litres produced over the lifecycle (m)	300	1,275	600
Average profit per litre over lifecycle	\$1.52	\$0.75	\$2.41

From the analyst's calculations in Appendix 1, Red has the highest profitability per litre of the three products at \$2.26, but this only covers a single period. As such, it does not consider costs which occur before production commences or after it ceases. When the costs of the products over their entire life cycles are taken into account, Red has the lowest average unit profit, the highest being Green at \$2.41. This change has occurred as the R&D costs, the cost of the study which will span 20 years and the decommissioning costs have now been recognised. Knowing the costs over the entire lifecycle of a product will help the agrochemicals division to better evaluate its investment decisions, determine appropriate prices and generate an acceptable margin.

(b) EMA

Environmental management accounting (EMA) involves the production of non-financial and financial information to support internal environmental management processes. This could involve measuring the physical movements of inputs to a production process, such as materials and energy, and outputs such as waste.

The agrochemicals division could also record financial data on costs and savings related to the environment. It appears that, in common with most other businesses, these costs are not currently identified by Alflonnsso's accounting system and they lie hidden within overheads.

Managers have no incentive to reduce these environment related costs as they are not even aware of them, or the costs of poor environmental practices. EMA allows an organisation to identify environment related costs and take steps to control them. Such costs are often categorised into conventional costs, contingent costs and reputation costs.

Conventional costs

These costs include the cost of energy and raw materials, and may remain hidden within overheads. The energy costs of the three new products in the analyst's income statement are simply combined with raw material and direct labour costs. This does not, for example, highlight the relatively high energy cost to produce Green. Being unaware of this cost, managers are unable to take steps to redesign the specification or production process for the product in order to reduce the cost.

Contingent costs

These are costs which are incurred in the future, for example, the decommissioning costs of plant used to manufacture Red. This cost is significant at an estimated \$45m, but occurs 15 years in the future and so the estimation is unlikely to be accurate.

Identification of these contingent costs will at least allow the agrochemicals division to more accurately estimate the cost of

each of the three new products. Also, by identifying these costs at an early stage, this may allow managers to redesign the specification or production process for the product in order to reduce the cost and help prevent managers from focusing only on short-term performance.

Reputation costs

Reputation costs are incurred where an organisation acts in a way which may cause harm to the environment, and include sales lost as a result of loss of reputation. These costs are hard to quantify. For example, the accumulation of the existing product, ALF6, in the soil is said to have a potential effect on crop yields which may lead to future claims from users of the product or to loss of sales due to its potential harm to the environment.

Similarly, Alflonnsö's failure, by producing Green, to improve crop yields in countries where food production is already scarce is likely to arouse disapproval by public and governments in the 25 countries where it operates. This again may result in lost sales or refusal by governments to grant licences for Alflonnsö to operate.

Making managers aware of these reputation costs should focus their attention on the need to manage the risks of them occurring.

4 (a) CSF of high quality design

The directors of LAA have identified the importance of producing high quality creative designs as a CSF to ensure successful advertising campaigns, and therefore client satisfaction. It is likely that having this as a CSF will help LAA achieve its objective to 'delight clients with the quality of work', as creative design is an important part of the service which LAA provides.

It is not clear, however, whether this CSF will help achieve the second of LAA's objectives to provide excellent value for money. It may be that other agencies produce a similar quality of work, but charge a lower price. Alternatively, the quality of LAA's design work may exceed that required by the client, who will be unlikely, therefore, to perceive it as good value for money.

Identifying this CSF will not directly help achieve the stated objective of providing clients with access to local and specialist knowledge. External suppliers may have more specialist knowledge than LAA can realistically replicate in its own design department.

The relationship between the quality of the creative design and the clients' perception of its value for money will determine whether the fourth objective, to have returning clients, will be achieved or not. All other things being equal, high quality design work will probably make clients more likely to return. Other aspects of LAA's service though, such as designing effective advertising campaigns and negotiating competitive rates for media buying, may be at least as important to the client.

KPI to buy 90% internally

Setting a KPI should lead managers to try and achieve this target, as they are appraised (and presumably rewarded) according to their performance against the target.

Having this target will only help achieve the objective of delighting clients if the quality of the design done internally exceeds that done by third party external designers. Though LAA has set up the 'centre for design excellence', this does not automatically mean the quality of work is any better than external agencies.

Encouraging managers to buy creative services internally does not necessarily help achieve the objective of giving value for money for clients. Managers at both B and C have indicated that the prices charged by the in-house design department are significantly higher than other agencies in the market. The use of the internal design department may not be best value for the client.

Encouraging the use of internal services may not help achieve LAA's third objective to offer specialist and local knowledge to clients. The design department is based entirely in Geeland and may not meet the needs of clients in other countries. The manager of B has already commented that the department did not understand the requirements of consumers in Veeland. This is also inconsistent with the objectives to delight clients and to have them return to LAA.

Similarly, managers in A have also commented that the internal department did not have specialist knowledge to meet the needs of a new client. Again, encouraging managers to use the internal department seems contrary to the objectives of providing clients with specialist knowledge in order to delight them and to have them as return customers.

(b) Transfer pricing policy

Autonomy of the subsidiaries

The purposes of a transfer pricing policy are to encourage subsidiaries' autonomy, facilitate performance evaluation and to promote overall goal congruence with the aim of LAA to maximise shareholder wealth.

As the three subsidiaries are profit centres, they will tend to make decisions which maximise their own profit. This may be at the expense of the other subsidiaries. By charging a higher transfer price to B and C for design services, A will increase its own revenue and also the costs for B and C. This may also be at the expense of LAA as a whole, for example, as C's client was unhappy by the high charges levied by A.

A transfer pricing policy helps to prevent subsidiaries from acting in an entirely self-interested way where this may not be in the best interests of LAA as a whole. Though a transfer pricing policy should promote autonomy of the subsidiaries, LAA's head office should have the power to impose a transfer price to maintain goal congruence across the organisation. This is not currently happening, and the high transfer prices charged for design services are causing dissatisfaction.

Both B and C have commented that they have spent large amounts of time trying to negotiate transfer prices with A. This is a waste of managers' time. The ability of head office to impose a transfer price, or the existence of a clear transfer pricing policy, would allow managers more time to deal with other key aspects of the business, such as ensuring client satisfaction.

Performance measurement in the three subsidiaries

A transfer pricing policy will enable the performance of the individual subsidiaries to be fairly measured. If the policy is unfair, for example, the gross margin at subsidiary C was reduced by the seemingly excessive transfer prices charged by A, managers' motivation will be reduced, especially if this reduces the subsidiaries' managers' rewards.

Setting clear, transparent and understandable transfer prices

Managers at B have complained that the basis for setting the transfer price from A is unclear. A transfer pricing policy should ensure that the basis for setting the prices is transparent, straightforward and well understood by managers so that they do not see prices as being set unfairly and thus become demotivated.

The basis for the prices set between subsidiaries in different countries should also be clear about how exchange rate movements are reflected in the transfer price, so that managers' performance is not appraised on factors which are outside their control.

Also, the transfer pricing policy for transfers between different countries should ensure that the prices are likely to be acceptable to the local tax authorities. The tax authorities in Veeland, where B is located, are already investigating the transfer prices charged by A. This is presumably because the authorities suspect that the transfer price may be set at an artificially high level in order to reduce tax paid on profits earned in Veeland. Having a clear transfer pricing policy may help to demonstrate that B is operating within relevant taxation laws and is acting ethically in setting a fair transfer price. As the internal design department has no external customers, then it may be preferable to operate it as a separate cost centre and make all transfers at marginal cost.

Tutorial note: *An approach which addressed the question based on the aims of a transfer pricing system, i.e. encourage autonomy, facilitate performance evaluation and promote goal congruence, would have been acceptable.*

(c) Advantages of setting transfer prices on the basis of market value

Transfer prices on the basis of market value reflect the prices of purchasing creative design services on the open market. Both buying and selling subsidiaries will know what the market price is and be able to compare this to the price they are paying or charging internally.

Where subsidiaries have autonomy to negotiate their own transfer prices, in order to maximise the performance of the individual subsidiaries, the transfer price agreed is likely to reflect market price. The buyer will be unwilling to pay more than the price it can pay on the open market. The seller will be unwilling to charge less to sell internally than can be obtained on the open market. This encourages efficiency in A, which has to compete with external suppliers of creative design services.

Where a market value transfer price is used, it will usually be beneficial for buyer and seller, as well as for LAA as a whole, to transfer internally. This is because selling and administration costs overall for both parties are reduced, and the buyer should get better customer service and reliability of supply by buying internally.

The transfer price charged by A currently includes an allowance for marketing costs and bad debts. These are unlikely to be incurred where internal transfers are made. The costs savings may be shared by both parties and the transfer price reduced to a level below the market value. This lower transfer price is known as the adjusted market price.

If the transfer price charged by A is calculated on a different basis from market value, which appears to be the case as A's prices are higher than the market rates, the subsidiaries will waste time arguing over the transfer price. This current approach may improve the subsidiaries' own performance, but this is not in the best interests of LAA overall.

Disadvantages of using market price

The use of external market price will only be the optimal transfer price when a perfectly competitive external market exists. For example, though creative services can be purchased on the open market, those services may not be identical with those provided internally. Subsidiary A had to use a third party design agency for its new client as it did not have the industry knowledge to do the work itself. In this case, there may not be an equivalent service available internally to those available externally, and vice versa. There may therefore be no realistic option to buy on the open market in this situation and the use of an external market price as a transfer price would be inappropriate.

The market price may be temporary, changing according to capacity of the service providers, changes in economic circumstances, or in the case of LAA, short-term variations in the exchange rate. In which case, the transfer price would need to be frequently changed if it were to continue to reflect market conditions. This would be time consuming and probably confusing to the subsidiaries' managers.

Where allowance is made in the transfer price for the reduced costs, for example, of marketing and bad debts, it may be difficult to agree an adjusted market price which is acceptable to both A and the subsidiary purchasing design services from A.

Professional Level – Options Module

Advanced Performance Management

March/June 2017 – Sample Questions



Time allowed: 3 hours 15 minutes

This question paper is divided into two sections:

Section A – This ONE question is compulsory and **MUST** be attempted

Section B – TWO questions **ONLY** to be attempted

Present Value and Annuity Tables are on pages 10 and 11.

Do NOT open this question paper until instructed by the supervisor.

This question paper must not be removed from the examination hall.

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Think Ahead

ACCA

The Association of
Chartered Certified
Accountants

Section A – This ONE question is compulsory and MUST be attempted

- 1** Dargeboard Services (DS), a listed company, provides facilities management (FM) services where it manages such activities as cleaning, security, catering and building services on behalf of its clients. Clients can outsource to DS a single activity or often outsource all of these aspects in a full service contract.

The mission of DS is 'to give the shareholders maintainable, profitable growth by developing the best talent to provide world-class services with maximum efficiency.'

The board have asked the chief executive officer (CEO) to review the effectiveness of Dargeboard's systems for performance measurement and management. She has turned to you to begin this process by considering the strategic performance dashboard of DS. She has supplied the most recent example in Appendix 1.

She wants a report to the board which will cover three aspects of strategic performance reporting at DS. First, it should address whether the current set of key performance indicators (KPIs) measure the achievement of the mission by showing how each one links to all or part of the mission. She does not want suggestions of new indicators. Second, taking each of the current indicators in turn she wants the assumptions underlying the calculation of the indicators examined. There has been a suggestion made in the press that DS is producing a biased set of results aimed to mislead the markets. This would then artificially boost the share price and so boost the value of the senior management's share holdings. Third, the report should evaluate the other presentational aspects of the dashboard against best practice.

The idea of employee share ownership has always been at the heart of DS' remuneration schemes. Its aim is to support an entrepreneurial culture and is a key differentiator in the market for new employees. The current reward system grants shares based on the appraisal of the individual by the line manager against vague categories such as leadership and entrepreneurship. The results of this scheme have been that only about 5% of staff received their maximum possible bonus in previous years and half of them received no bonus at all. Increasingly, this has led to the staff ignoring the reward scheme and describing it as 'only for the bosses' favourite people'.

In response to this, the board have been discussing methods of analysing and improving the rewards system at DS. One non-executive director suggested using Fitzgerald and Moon's building block model. The CEO was asked to consider this as a project separate from the issues of performance measurement mentioned above. She will select suitable indicators from the dimensions but currently needs you to explain to the board what is meant by results and determinants in this context and how the dimensions link to standards and targets. Finally, she believes that there are two types of reward scheme which might suit DS and wants an evaluation of their relative strengths and weaknesses. The scheme details are given in Appendix 2.

Required:

Write a report to the board to:

- (i) Evaluate the links between the current key performance indicators at DS in Appendix 1 and its mission.** (8 marks)
- (ii) Assess the assumptions and definitions used in the calculation of the current set of key performance indicators in Appendix 1.** (12 marks)
- (iii) Evaluate the other aspects of reporting in the DS performance dashboard given at Appendix 1.** (8 marks)
- (iv) Explain how the building block model works as required by the CEO.** (6 marks)
- (v) Assess the two reward schemes given in Appendix 2.** (12 marks)

Professional marks will be awarded for the format, style and structure of the discussion of your answer.

(4 marks)

(50 marks)

Appendix 1

Dargeboard Services: Strategic performance dashboard

Year to 31 December 2016

	Cleaning	Security	Catering	Building services	Full service	Total	Total 2015
Operating profit margin	6.5%	6.4%	6.5%	4.9%	5.9%	5.9%	5.8%
Secured revenue	76%	85%	92%	88%	93%	88%	87%
Management retention	86%	74%	87%	82%	89%	85%	87%
Order book (\$m)	1,160	875	357	1,553	3,359	7,304	6,807
Organic revenue growth	7.1%	4.3%	5.0%	8.1%	7.9%	7.2%	4.6%
ROCE						17.2%	16%

KPI definitions and notes

1. Cleaning, security, catering and building services headings are for single service contracts.
2. No commentary is provided as the CEO talks the board through the dashboard at each board meeting.
3. Secured revenue is long-term recurring revenue. This is the percentage of budgeted revenue which is already contracted. The budget is often not completed until well into the year as it is a complex process. In 2016, the original budget showed revenue of \$1,565m with the final budget signed off at the end of Q1 showing \$1,460m. The secured (contracted) revenue for the period was \$1,285m. The accounts show a year end revenue of \$1,542m.
4. Management retention is the percentage of managers who were still employed throughout the whole year. The figure only includes those employees on full-time contracts (about 65% of all managers).
5. Order book is the total cash value of future contracted revenue. DS has contracts which run up to 10 years into the future.
6. Operating profit margin. This excludes exceptional items such as the reorganisation of the catering business which cost \$55m in 2016, where revenue was \$245m.
7. Organic revenue growth is calculated by using the total revenue figure as reported in the accounts. It includes net acquisitions which brought in revenue of \$48m in 2016.
8. Return on capital employed (ROCE). Capital employed is total assets less current liabilities from the statement of financial position.

Appendix 2

The CEO is considering two schemes, one based on the current scheme and a new scheme.

Scheme 1 (based on the current scheme)

The reward system grants shares in DS based on the appraisal of the individual by the line manager against vague categories (leadership and entrepreneurship). The line managers have been informed that their bonus will in turn be partly dependent on how well they perform this appraisal. The expectation will be that as a result, 20% of staff will receive their maximum possible bonus and 20% will receive no bonus.

Scheme 2 (the new one)

Under scheme 2, employee targets are to be derived from the strategic indicators depending on the employee's area of responsibility. The senior management (with help from line management where appropriate) will cascade down the strategic indicators to the relevant operational or tactical level for that employee.

There will be five targets set by senior and line management in consultation and the employee will then get up to 50% on top of their basic salary as a bonus (10 percentage points for each of the targets achieved).

Section B – TWO questions ONLY to be attempted

- 2 Pitlane Electronic Components (Pitlane) manufactures components for use in the electricity distribution network in Deeland. Demand from Pitlane's biggest customer, to replace identical but worn out components, has been constant for many years. Pitlane has recently renewed an exclusive long-term supply agreement with this customer, who has always agreed to buy the components for their total standard cost plus a fixed profit margin of 15%. Variances between standard and actual costs of the components are negligible. Pitlane runs several production lines in two factories located in different areas of Deeland. The factories' layout is poorly designed and the production process requires components to be transported around and between the factories.

The Deeland government wants to encourage renewable electricity generation. It is offering a three-year subsidy scheme, beginning in 2018, for consumers to have solar panels installed on the roofs of their homes. As an added incentive, businesses will be exempt from tax on profits made on the sale of solar panels and related components.

To take advantage of this scheme, Pitlane has built a prototype of a new electrical component, known as the 'Booster', which increases the output from domestic solar panels. The Booster will be sold to installers of solar panels and not directly to consumers. Pitlane's marketing department has estimated market data for the duration of the scheme based on a similar scheme in Veeland (Appendix 1). As a result of its products being unchanged for many years, Pitlane has little recent experience of developing new products and estimating costs and potential revenues from them. It is expected that many competitor products will be launched during the scheme, at the end of which demand is expected to fall greatly, and production of the Booster will discontinue.

Pitlane's shareholders insist that for the Booster project to go ahead, it must meet the financial performance objective of achieving a 15% net profit margin, after all costs, for the duration of the scheme.

The Booster's total fixed costs during the scheme are estimated to be \$10m, including \$2.8m upfront development costs to enable the Booster to communicate the amount of solar energy generated directly to consumers' smartphones via an app. The product development team at Pitlane believes this feature, and the use of highest quality packaging, will allow it to charge 10% more than the average price of its competitors. The marketing team, however, has questioned the overall value of these two features and whether customers would be prepared to pay extra for them, as most of the Deeland population do not yet own smartphones.

Pitlane has estimated the direct costs for the Booster (Appendix 2). The largest direct cost is for the four main sub-components. These are bought in bulk from six different suppliers in Deeland, though all are readily available from suppliers worldwide. The sub-components are fragile. During production of the Booster prototype, many sub-components were found to be damaged during the production process by workers incorrectly assembling them. This resulted in the completed prototype Boosters being scrapped after testing by the quality control department. The manufacturing director is concerned that the incorrect assembly of sub-components by workers may mean that it may not be profitable for Pitlane to start full scale production of Boosters. To counteract these quality problems, Pitlane will employ more highly skilled workers, who are paid around 30% more than most other workers in the business which is accounted for in the cost estimate given in Appendix 2. Pitlane staff have never been encouraged to suggest any ways to improve the manufacturing process.

Pitlane's directors are concerned that the Booster project will not meet the shareholders' financial performance objective. They have asked you, as a consultant experienced in target costing, Kaizen costing and other Japanese business practices, for your advice.

Required:

- (a) Calculate the cost gap per unit in each of the three years of the Booster's life, taking into account all estimated costs. (6 marks)
- (b) Advise on the extent to which target costing would help Pitlane to achieve the financial performance objective set by the shareholders. (12 marks)
- (c) Advise Pitlane how Kaizen costing may be used to help the Booster project achieve the financial performance objective set by the shareholders. (7 marks)

(25 marks)

Appendix 1 – Estimated market data for Booster

	2018	2019	2020
Total market size (units)	600,000	500,000	460,000
Average price of competitors products (\$/unit)	180	170	160
Booster market share of total market	10%	15%	20%

Appendix 2 – Estimated unit direct cost of Booster

	\$
Sub-components	94
Assembly labour	21
Packaging	10
Distribution	2
Internal transport and handling	7
Total	134

- 3 Nelson, Jody and Nigel (NJJ) operates a warehouse and distribution centre, storing and distributing 5,000 product lines on behalf of its client, an overseas sports equipment manufacturer.

NJJ receives goods in shipping containers, which should include a packing list of the items they contain. Sometimes, packing lists are lost in transit and the manufacturer is asked for duplicates. Packing lists are manually input into NJJ's warehouse information system (WIS) in batches, usually within 48 hours of the goods being received. Goods are first unpacked into a sorting area, and later moved to wherever there is available warehouse space once the packing list has been input. The WIS records the location within the warehouse where each item is located. The client's customers, who are retail stores, place orders by email, and do not currently have access to real-time inventory levels in NJJ's warehouse.

Each morning picking lists are printed in the warehouse office. These lists show the quantities of items to be picked and the items' 12 digit product codes. Staff use these codes to retrieve items from the warehouse locations for despatch to retailers. In 8% of picking lists, at least one item is not in the location or does not have the quantity specified by the WIS. As a result, the item is not despatched, or the wrong item is picked. A small team investigates these discrepancies, using special reports which the warehouse manager extracts from the WIS. The team manually reconciles quantities of missing items in the warehouse to the sports equipment manufacturer's own records of the items which should be in inventory. If missing items cannot be found, the customer is informed via an email that they are unavailable.

The sports equipment manufacturer has a service level agreement with NJJ, covering the accuracy of picking and the proportion of customers' orders successfully fulfilled. NJJ's performance on these has deteriorated, especially when there is increased seasonal demand for certain products. At these times staff are under increased pressure to pick items quickly, and so picking accuracy deteriorates and absenteeism increases. There have also been accidents where goods have not been safely placed or safely picked from warehouse locations at busy times. These accidents have resulted in minor injuries to some employees.

The sports equipment manufacturer has threatened to end NJJ's contract if performance does not improve. In response, NJJ has recruited more staff to investigate discrepancies between items physically in warehouse locations, and those shown on the WIS at busy periods. It has also begun a series of cyclical inventory counts where every product line is counted every month to correct the quantities and locations shown on the WIS. NJJ has rented an additional nearby warehouse in which to sort incoming items before they are put away.

NJJ has hired a management consultant who is an expert in 'lean' principles and the application of these to management information systems. She believes that the WIS is wasteful, not adding value to the business or to its customers, and has suggested that NJJ would benefit from the application of lean principles to this system.

She has suggested three proposals:

- that NJJ reorganise the warehouse by storing high volume items close to the despatch area,
- shut down the additional warehouse, and
- discontinue the cyclical inventory counts.

To help with the adoption of lean principles in the warehouse reorganisation, the management consultant

recommends NJN apply the '5Ss'* of lean principles, and she has suggested performance metrics which can be used to evaluate NJN's progress towards adopting these (Appendix 1).

*Structurise, Systemise, Sanitise, Standardise, Self-discipline.

Required:

- (a) Assess whether NJN's existing warehouse information system (WIS) is effective in reducing waste and adding value in NJN's workflow.** (10 marks)
- (b) Advise whether the three proposals suggested by the management consultant will help to eliminate the different types of waste identified under lean principles.** (6 marks)
- (c) Evaluate whether the application of each of the 5Ss following the warehouse reorganisation at NJN is adequately measured by the performance metrics in Appendix 1.** (9 marks)

(25 marks)

Appendix 1 – Performance measures for 5Ss relating to warehouse reorganisation

1. Warehouse manager's daily assessment of the tidiness of the warehouse on a scale of 1–10.
2. The proportion of inventory not stored in order of its alphabetical description with products with names beginning with 'A' nearest the despatch area and 'Z' furthest away.
3. The number of accidents caused by goods being incorrectly stored or picked.

- 4** Jenson, Lewis and Webb (JLW) manufactures tubes of acrylic paint for sale to artists and craft shops in Kayland and Seeland. JLW has two divisions, Domestic division and Export division, both based in Kayland. All costs are incurred in Kayland Dollars (\$KL). Domestic division is an investment centre and sells only to customers in Kayland. Export division is a profit centre and exports all its products to Seeland, where customers are invoiced in Seeland Pounds (£SL), at prices fixed at the start of the year. The objective of JLW is to maximise shareholder wealth.

At the beginning of the year ended 31 December 2016, the head office at JLW purchased new production machinery for Export division for \$KL2.5m, which significantly increased the production efficiency of the division. Managers at Domestic division were considering purchasing a similar machine, but decided to delay the purchase until the beginning of the following financial year. On 30 June 2016 the \$KL weakened by 15% against the £SL, after which the exchange rate between the two currencies has remained unchanged.

The managers of the two divisions are currently appraised on the performance of their own divisions, and are awarded a large bonus if the net profit margin of their division exceeds 8% for the year. Extracts from the management accounts for the year ended 31 December 2016 for both divisions are given in Appendix 1. On being told that she would not be receiving a bonus for the financial year, the manager of Export division has commented that she has had difficulty in understanding the bonus calculations for her division as it is not based on traceable profit, which would consider only items which relate directly to the division. She also does not believe it is appropriate that the net profit margin used to appraise her performance is the same as 'that which is used to evaluate the performance of Export division itself'. She has asked for a meeting with the directors to discuss this further.

JLW's directors intend to award divisional managers' bonuses on the basis of net profit margin achieved in 2016 as planned, but have asked you as a performance management consultant for your advice on the comments of the Export division manager in advance of their meeting with her. One director has also suggested that, in future, economic value added (EVA™) may be a good way to evaluate and compare the performance of the two divisions. You are asked for your advice on this too, but you have been specifically asked not to attempt a calculation of EVA™.

Required:

- (a) Evaluate the comments of the Export division manager that the net profit margin used to appraise her own**

performance should be different from that used to appraise the performance of Export division itself.

(7 marks)

(b) Recommend, using appropriate calculations, whether the manager of Export division should receive her bonus for the year. (8 marks)

(c) Advise whether the use of economic value added (EVATM) is an appropriate measure of performance of the two divisions. You are not required to perform an EVATM calculation. (10 marks)

(25 marks)

Appendix 1 – Extracts from management accounts for year ended 31 December 2016

\$KL'000	Export division	Domestic division
Revenue ¹	8,000	12,000
Cost of sales	<u>(4,800)</u>	<u>(7,800)</u>
Gross profit	3,200	4,200
Depreciation	(395)	(45)
Allocated head office costs	(360)	(540)
Other overheads ²	<u>(1,900)</u>	<u>(2,300)</u>
Net profit	545	1,315
Net profit margin on revenue	6.8 %	11.0 %
Capital employed ³	6,500	8,500

¹ Revenue accrues evenly over the financial year.

² Other overheads for Domestic division include the creation of a bad debt provision equivalent to \$KL75,000 for a wholesale customer who had financial difficulties during the year, and \$KL90,000 for advertising a new range of paints launched at the end of the year.

³ JLW is financed in equal proportions by debt and equity. The cost of equity is 8% and the after tax cost of debt is 5%.

Answers of Above Question Paper

Professional Level – Options Module, Paper P5
Advanced Performance Management

March/June 2017 Sample Answers

1 Report

To: The board of DS

From: An Accountant

Date: March 2017

Subject: Strategic performance reporting and reward systems at DS

This report assesses the coherence of the choice of key performance indicators (KPIs) with the mission of DS followed by the assumptions used in their calculation. Other aspects of the presentation of the dashboard report are then evaluated. Finally, an overview of the operation of the building block model and an assessment of two proposed reward schemes are provided.

(i) Linking the mission to the current KPIs

The mission statement can be broken into several parts. The principal aim is maintainable, profitable growth which is supported by three further goals: developing the best talent; providing world-class services; and being efficient.

The KPIs are linked to elements of this statement as follows:

- Operating profit margin shows that the organisation is profitable and also as a margin, it indicates efficiency in cost control.
- Secured revenue indicates the amount of revenue which is contracted and so has greater likelihood of being earned. Contracts give an indication of maintainability though here only in the short term.
- Management retention links to the need for best talent though it does not measure the developing of that talent.
- Order book shows the maintainability into the future of the business though it does not show the average length of the contracts.
- Organic revenue growth shows historic growth and may indicate what the management are capable of into the future.
- ROCE demonstrates the efficiency of profit-generation from the capital base of DS.

None of the measures are external, looking at the competitive environment and so it is not possible to indicate if DS has 'world-class services'.

(ii) Assumptions underlying the current KPI calculations

Every KPI will involve some assumptions in its calculations. The aim of this section is to highlight how each indicator could be manipulated to show a better picture so that the business can avoid this in the future and the subsequent bad image portrayed in the investing community.

Operating profit margin is a standard performance measure and the only area which can be questioned is the categorisation of costs below this line, for example, the movement of operating costs into 'exceptional costs' below this line in order to artificially inflate this indicator. If the \$55m reorganisation cost was included in overall operating profit which was \$91m (=5.9% of \$1,542m) then the business would show an operating margin of 2.3%. The catering business would show a loss of \$39m.

Secured revenue represents long-term recurring revenue streams. A good picture will show a high percentage of secured revenue but will be below 100% so that management can indicate that budget targets are being exceeded. It is worrying that the budget is completed well after the year start as this may indicate such manipulation. If the original budgeted revenue figure is used then the secured revenue for 2016 was 82%.

Management retention only includes retention of employees on full-time contracts which at 65% of all managers excludes a material number. Poor treatment (and thus retention) of part-time managers is therefore ignored. This may be a particular issue for managers with young children who often take advantage of such contracts.

Order book is a 'total 'value' figure but is this the cash or present value figure? By choosing cash value of the contract, this will give a much larger figure than the discounted present value, especially where some revenues will not be received for 10 years.

Organic revenue growth is calculated by using the total revenue figure as reported in the accounts. The main purpose of stating organic is that it is growth from within the organisation as it stands and so acquisitions should be ignored. The current figure would fall from 7.2% overall to a less impressive 3.9%.

Return on capital employed (ROCE). Capital employed is being calculated using the statement of financial position figures which may exclude many intangible assets. As such it may overemphasise the tangible capital base which is not as important in a service business such as DS. The focus on this measure can lead to suboptimal decisions.

(iii) Evaluation of the strategic performance dashboard

The current information used by the board is both financial and non-financial allowing different elements of the mission to be measured. However, none of the measures are external, looking at the competitive environment and so it is not possible to indicate if DS has 'world-class services'. Also, the measures do not focus on shareholder concerns although the mission statement indicates that they are the principal stakeholders. Other measures beyond ROCE might have been expected given that priority, such as EPS or dividend per share. No breakdown of ROCE is provided for each business unit, this may be due to the lack of availability of capital employed figures for the units but it does seem an odd inconsistency since ROCE is the best KPI provided for shareholder use.

No revenue figures are given and as most figures are ratios it is not possible to gauge the absolute scale of the business. It is particularly surprising that an absolute profit measure is not included on the dashboard given the importance of profitable growth to shareholders.

Generally, there is a lack of external figures to allow benchmarking or the assessment of the competitive position of DS.

The breakdown of results into business sectors will help in the judgement of performance of the managers of those units but they may not be comparable, for example, comparing building services and security, it seems that building services is growing more rapidly but with weaker margins. Also, it may be that the employment market is different between each sector and so no comparison of management retention figures is sensible. Again, it may be helpful to provide either an external benchmark through industry averages or an internal one through a historic trend for these sector specific indicators.

The report does have good qualities as it is brief and clearly presented. The use of ratios makes for easy understanding.

(iv) The building block model

The model takes the important step of distinguishing within the dimensions of performance between what is the desired outcome (results) and what are the drivers of those results (determinants). It then highlights the need to measure both within the performance reporting systems of an organisation.

The standards are the target level for the specific measures chosen for each dimension appropriate to an employee's performance. Employees must take ownership so they need to be persuaded to accept the target and be motivated by the targets. Targets must be achievable and so challenge the employee without being viewed as impossible to achieve and so be demotivating. For example, they must take account of external market conditions which will be beyond the control of the employee, but this can be managed by benchmarking against an industry average. Targets must be fair, for example, different businesses within DS must be measured against their sector (catering, security, etc).

(v) Assessment of the proposed reward schemes

As the board is already considering using the building block model, it is appropriate to outline the main criteria in the model for reward schemes.

Rewards must be

- clear, that is, understood by the managers;
- motivating, that is, of value to the employee; and
- controllable, that is, related to their area of responsibility.

Scheme 1

The scheme has the benefit that it continues with the successful policy of offering an equity share in DS. It continues to utilise the knowledge of the line manager in performing the appraisal. It attempts to address a problem of the current scheme which is that the breadth of the categories gives the line manager scope to continue to show favouritism to specific employees. This is addressed as the bonus for line management will be affected by their appraisal according to performance on this new scheme and it will be helped practically by giving them an expectation of the distribution of bonus shares. This will also mean that forecasting staff costs will be simpler.

However, this scheme does not address the problem that the appraisal categories are vague and do not reflect the KPIs of DS. It also could create a problem as line managers will give bonuses according to the stated expectation, for example, even where all staff are, in absolute terms, performing brilliantly only 20% will get the maximum. Also, there is no mention of the scale of the scheme bonuses as there is for Scheme 2, where the maximum is stated as 50% of basic salary.

Scheme 2

Scheme 2 loses a key benefit of the current scheme in not rewarding in shares but cash is an acceptable alternative. Cash may well be a preferred option for the managers as it offers a certain value to them. This form of benefit also reduces the desire to manipulate share prices. It sets standards based on the KPIs and so should lead to greater focus by each employee on the goals of DS. Involvement of both strategic and line management in this process should lead to a better set of measures being used.

It is not clear, however, why five targets are being chosen. This seems an arbitrary figure and it may be more sensible to suggest a range from three to six (the number of strategic KPIs) to be decided by the managers in consultation. The size of the maximum reward seems likely to motivate but the equal weighting for each heading may not be effective. It requires that, say, operating profit margin has the same importance as management retention.

2 (a)	2018	2019	2020
Basic selling price	180.0	170.0	160.0
10% uplift for features/packaging	18.0	17.0	16.0
Estimated selling price	198.0	187.0	176.0
Less: 15% net profit	(29.7)	(28.1)	(26.4)
Target total cost per unit	168.3	158.9	149.6
Current expected cost:			
Estimated total direct cost per unit	134.0	134.0	134.0
Estimated fixed cost per unit (W1)	44.1	44.1	44.1
Estimated total cost per unit	178.1	178.1	178.1
Cost gap	9.8	19.2	28.5

W1 – Fixed overhead cost per unit

= Total fixed overheads/Number of units sold

= \$10,000,000/227,000 units = \$44.05

(b) Target costing

Pitlane currently operates a traditional cost plus pricing method, where customers pay a fixed mark up on Pitlane's standard cost. This has been appropriate because the components currently produced have been manufactured in the same way for

some time and their cost structure is well understood. Actual costs of production are very close to the standard costs. There is little competition in the market for Pitlane's current products, as a long-term contract was recently renewed with its biggest customer.

In contrast, for the proposed Booster product, the market price is only estimated. To compete with similar products, the Booster will need to sell at a price reflecting that of competitors' products, taking into account the different benefits and quality which each product has.

Target costing begins with taking the price which the market will pay for the product for a given market share. From that, the required profit margin is deducted to arrive at a target cost. The difference between the estimated cost for the product and the target cost is the cost gap. Where the estimated costs exceed the target cost, steps are taken to reduce the cost gap. The product can then be sold at a price which the market will accept, and which generates an acceptable profit margin.

Determining the market price

Pitlane's marketing department has estimated the average market price of competitors' products and the likely market share over the three years of the scheme. The estimates are based on the success of a similar scheme in Veeland, and the assumptions used could be incorrect. Electricity prices may already be higher in Veeland than in Deeland, meaning consumers there would reduce their energy costs more by installing solar panels. Similarly, consumers in Veeland could save more on energy costs if there is more sunshine there than in Deeland, enabling solar panels to generate more energy. Both factors would, in this case, reduce the take up of subsidies by consumers in Deeland and the amount they would be willing to pay for solar panels.

The domestic solar energy market is new in Deeland, and Pitlane has no experience in estimating market share or price for this type of product. Pitlane's belief that consumers would be willing to pay a 10% premium for highest quality packaging, or for the Booster to communicate with consumers' mobile phones, may be incorrect.

Calculating the target cost using the required profit margin

Pitlane charges a 15% profit margin on its existing projects. The shareholders' financial objective indicates that they require the same profit margin to be earned on Booster.

For its existing products, Pitlane can set a selling price based on its own costs, whereas the Booster's price must reflect external market conditions more closely. Target costing will focus Pitlane on the external environment by considering prices and relative benefits of competitors' products.

Estimating total costs of Booster

The total direct costs of Booster have been estimated at \$134.00. The fixed overhead per unit relating to Booster for the three years of the scheme is \$44.05, making total estimated costs per unit of \$178.05. The cost estimates may be incorrect, especially as Booster is new, and different from Pitlane's existing products. As Booster includes costs which are fixed, estimating sales volumes is also crucial in determining costs per unit.

Pitlane has no recent experience of developing new products or of estimating costs and sales volumes for them. This makes it more likely that the cost estimates for the Booster will be incorrect. Estimating the total costs is needed for the next stage in the target costing process, to identify the cost gap.

Reducing the cost gap

A big advantage for Pitlane of using target costing is that it is often easier to reduce costs of a product at the design stage rather than after it has entered production.

As Boosters are not sold directly to consumers, the buyers of the product, who are professional installers, may not see value in the highest quality packaging. This could be a significant yet unnecessary cost, to be eliminated at the design stage. In deciding what costs to eliminate, Pitlane will have to take into account the effect of these on the quality and perception of the final product.

The features where the Booster can communicate with consumers' smartphones, and the use of highest quality packaging, are believed to enable Pitlane to charge 10% more than competitors' products. The \$3.8m (W1) of estimated additional total revenue from the packaging and smartphone features may not justify the \$2.8m upfront development costs for the smartphone feature alone, especially if the time value of money were to be taken into account. Consumers may not value these two features or be prepared to pay more for them. Eliminating them would therefore have little effect on sales volumes and would enable Pitlane to charge a more competitive price, or obtain higher gross profit margins.

Due to damage of sub-components when assembling the prototype, the estimated assembly labour cost assumes highly skilled labour will be used. This is 30% more expensive than other labour. By providing additional training, lower paid labour could be used to produce the Booster, and hence reduce the cost gap.

Pitlane plans to purchase the four main sub-components in bulk from six different suppliers. Consolidating suppliers, or using suppliers in lower cost countries, could help reduce the cost gap by reducing purchase costs. Moving to a just-in-time production system, rather than buying supplies in bulk, would help reduce costs of holding inventory as suppliers would only deliver sub-components when needed. This may increase other costs such as by requiring investment in information technology. It would also take time to develop the close relationship required with suppliers.

Another source of waste is due to internal transport and handling, which forms over 5% of the total direct cost of the Booster. This will also increase production cycle times, and is an unnecessary process which does not add value. It could be eliminated by changing the layout of the factory, or reorganising production into teams and ensuring all production was done at a single

factory, rather than in both of Pitlane's factories.

W1 – Additional revenue from smartphone feature and highest quality packaging

2018 – 60,000 units x \$198 = \$11.880m

2019 – 75,000 units x \$187 = \$14.025m

2020 – 92,000 units x \$176 = \$16.192m

Total revenue = \$42.097m

= \$42,097,000 x 10/110 = \$3,827,000

Tutorial note: *This is a detailed solution and candidates would not be expected to produce an answer of this length.*

(c) Kaizen costing

Unlike target costing, which occurs at the beginning of a product's life, Kaizen costing is a process of long-term continuous improvement by cost reduction throughout the life of the product.

The Booster will be produced only for the three years during which the Deeland government offers subsidies and tax incentives. Generally, Kaizen costing is used over longer periods, and it is likely the full benefits of this approach will not be achieved in such a short timescale. The target cost is the starting point for Kaizen costing. After production begins, each period's target is based on the previous period's reduced costs.

Target costing can achieve large cost reductions at the design stage of the product, e.g. by choosing not to develop the smartphone feature. Kaizen costing, however, reduces costs in much smaller, incremental steps.

The need for continuous improvement

Even though Booster's share of the market rises over the three years of the project, the market price falls, as does the size of the market. Which means that in order to achieve the shareholders' financial targets, the direct costs of the Booster must fall over the three years. Continual incremental improvements using Kaizen costing, and measuring these improvements against targets from the previous period rather than the original estimated cost, could help to achieve this.

Ways to reduce waste using Kaizen costing

Traditional costing methods often see employees as the cause of high costs, whereas Kaizen costing sees the employees as a source of ideas on how to reduce costs. The manufacturing director's comments, that the damage caused by employees to delicate sub-components may mean it may not be possible to produce the Booster, indicates that Pitlane is currently following the traditional approach. Employees are seen as the source of the waste.

To benefit from Kaizen costing, Pitlane must undergo a culture change to encourage employees to suggest ideas, perhaps using quality circles, to reduce costs. That way, improvements could be made in the way sub-components are assembled during production, which would shorten the production cycle and lead to a reduced cost of scrapped items.

3 (a) Manual input

At NJN, at least some of the inputs to the WIS are manual, and that means they are prone to error. This is time consuming and costly.

The packing lists which are received in the shipping containers are input manually. If incorrectly input, the quantities of items in the locations in the WIS will also be incorrect. Incorrect information in the WIS wastes time by needing teams to investigate the discrepancies, reconcile inventory records with those held by the manufacturer, and correct the information held on the WIS.

Furthermore, customers will not receive the items they have ordered, as in 8% of picking notes, items are not in the location they should be, or are in insufficient quantities. This is a high proportion of errors. Staff will waste time looking for items

stored in the wrong locations. This will cause customer dissatisfaction and mean that larger quantities of inventory will need to be held, which is a wasteful use of storage space. Fewer complete orders can be fulfilled per unit of warehouse space, than would otherwise be the case. Both of these are sources of waste.

In the longer term, this means NJN staff must undertake a series of cyclical inventory counts in order to correct the information held in the WIS. This is wasteful activity which does not add value to customers, and should be eliminated.

The provision of accurate inventory information will also be of value to the retailers who can place orders only for items which are available, rather than only finding out about unavailable items by receiving an email from NJN. This would lead to increased customer satisfaction by avoiding having stock outs of particular items by ordering alternatives.

NJN should consider the use of barcodes or radio frequency identifiers (RFIDs) on products, to ensure that accurate data is input into the WIS. Using these devices, the product numbers and quantities of goods entering and leaving the warehouse could be automatically read into the WIS, without any intervention from warehouse staff. This would reduce the time taken to manually input the data and improve its accuracy.

An effective information system may interface directly with the manufacturer's and retail customers' information systems through electronic data interchange (EDI). This would increase service levels by ensuring that all parts of the value chain had access to accurate and timely information.

Time delays

The packing list batches are not available until up to 48 hours after receipt of the goods. The information held in the WIS will therefore be out of date. Items which are required for sales orders may be unavailable for picking. The use of automated input, where possible, will increase the timeliness of the information input into the WIS. This will reduce the labour cost of correcting the system and improve the number, accuracy, and completeness of orders despatched to customers.

Currently, all picking notes are printed in the warehouse office, which may be some distance from the area where items are picked. This also implies the existence of a bottleneck in the provision of information to the staff picking the items and wastes staff time moving to and from the warehouse office to pick up the reports. An improvement would be to ensure that information is available when and where it is needed, using terminals in the warehouse, or portable devices such as tablets. This would reduce time spent collecting picking information.

Similarly, in order to investigate discrepancies, staff have to obtain special reports which the warehouse manager extracts from the WIS. Again, this is a bottleneck which could delay staff getting the correct information, and may mean that the reports are inconsistent depending on the parameters set to run them. An effective system would eliminate these problems by providing standardised reports when requested, and in an optimal location.

Complex presentation of information

Effective systems add value to information when they organise and present the information in a clear way, without excessive detail. This allows the users to easily and quickly identify the information they need. It prevents wasting time obtaining the information in the first place, and correcting errors caused by interpreting it incorrectly.

The picking sheets show the 12-digit product codes which can easily be misread and increases the likelihood of errors. A better system would present the information in a more accessible way and prevent information overload, for example, showing product descriptions, or product codes, only for the items to be picked.

- (b) There are two main types of waste at NJN which can be identified using lean principles: waste which does not add value to the customer and waste which occurs due to variations in demand and demands on staff.

Reorganising the warehouse to place high volume items near to the despatch area will help reduce the type of waste where the movement of staff to pick goods is more than should be required. Less movement, which means less staff time and cost, will be required by staff to pick these items and bring them to where they are to be despatched. It may be, however, that large and bulky items should be placed nearer to the despatch area instead, to save on the time spent transporting them to the despatch area. This may also address the increased seasonal demand for certain types of product as products which are popular for that specific period could be stored more closely to the despatch area.

The cost of absenteeism is a waste caused by demanding too much of staff at busy times to compensate for inefficient organisation in the warehouse and errors in the WIS. The cost of searching for items which have been put in the wrong physical location at busy times is a waste due to variation in activity levels.

Another type of waste which does not add value to the customer is holding excessive inventory, for example, the additional warehouse space which NJN has rented. By not making efficient use of the warehouse space it has, NJN is reducing its level of output, and revenue, relative to the resources available to it. In addition, the extra warehouse space means more time spent by staff moving through the warehouses trying to locate goods.

The cyclical inventory counts which the management consultant has suggested do not add value to the customer and are also more demanding for staff. This is a wasteful activity, correcting the errors which have occurred in the WIS. NJN should instead concentrate on ensuring that errors do not occur in the first place, which will cost less than correcting them.

- (c) The 5Ss in the adoption of lean principles during the warehouse reorganisation are Structurise, Systemise, Sanitise, Standardise and Self-discipline.

Structurise

This involves introducing order where possible, for example, by ensuring that items in the warehouse are arranged so that they are easy to find. This would also include segregating damaged or obsolete inventory, or discarding it from the warehouse.

The management consultant has suggested the measure of the proportion of inventory not stored in order of its alphabetical description, with 'A' nearest the despatch area and 'Z' furthest away. This may measure how easy to find each product is, but would not necessarily make best use of all available space or make the picking process more efficient. It may also be subjective and prone to errors caused by the interpretation of the product description, for example, in deciding if cricket balls be measured under 'C' or 'B'.

Systemise

This principle involves organising items so that they are easy to use. At NJN, this means being able to accurately pick the correct items in the shortest possible time. It could also cover access to other resources, such as having computer terminals close to where they are needed.

The measure relating to the storing of goods alphabetically seems to conflict with the consultant's recommendation to place the high volume lines close to the despatch area. Whereas storing goods alphabetically may make items easy to find, it does not necessarily make them easy to use (pick). By storing the high volume items near to the despatch area, the average time taken to pick orders would be reduced.

Sanitise

This principle means to be tidy and avoid clutter. This helps make things easy to find, allows easy access of staff around the warehouse, and helps make a safe working environment. The warehouse manager's daily assessment of tidiness is a suitable measure of this principle, which is a subjective assessment.

There is the possibility that the assessment will be biased, especially if the warehouse manager who is undertaking the assessment is also having his performance evaluated on the tidiness of the warehouse. The characteristics of what constitutes a tidy warehouse, compared to an untidy one, will need to be defined. There is the possibility of inconsistent measurement if someone other than the warehouse manager does the assessment, or the assessment is done at different times of the day.

Standardise

This principle involves finding the best way of undertaking a process or task, and applying it consistently. The suggestion of the number of accidents caused by goods which have not been stored or picked in the correct way would measure this. As NJN should aim to have no accidents, this should be a performance measure with a target level of zero.

Self-discipline

This principle relates to sustaining the other Ss by motivating employees. Motivation is subjective, and hard to measure. None of the performance measures the management consultant has suggested directly measure this principle. The consistency in which specific tasks or processes are performed could be a measure of how well they are being sustained.

- 4 (a) A key characteristic of divisional performance measurement is that divisional managers, and the divisions themselves, should only be appraised on performance that they control. For example, costs which are not controlled by divisional managers, such as JLW's apportioned head office costs, should be added back to profit when appraising manager's performance.

Similarly, as Export division is a profit centre, divisional managers are not able to make capital investment decisions and so depreciation is out of their control and should be added back to profit for their appraisals. Domestic division is an investment centre, so managers there can make investment decisions, and depreciation is a cost which they can control.

On 30 June 2015, the \$KL weakened by 15% against the £SL. This meant Export division benefited from an increase in revenue which was not under the control of the divisional manager. This amount must be deducted from revenue when calculating the controllable net profit for Export division.

The net profit arrived at after items which are not under managers' control are added back is known as the 'controllable profit'. This is what divisional managers should be appraised on. This is because it is unfair to appraise them on factors outside their control, and may mean they become demotivated or give up trying to improve performance, which is not in the interests of JLW as a whole.

Divisional performance should be evaluated on all the items which relate directly to the division which is its 'traceable profit'. Allocated head office costs do not directly reflect the activity of the division and should be excluded when calculating the traceable profit.

The traceable net profit for Export division, after adjusting for allocated head office costs, was \$KL905,000 (W1), and the traceable net profit margin was 11%.

A difficulty with calculating controllable and traceable profits in this way may be that it is difficult to determine which items are controllable or not. For example, though the new machine purchased for Export division by head office did lead to improvements in productivity, the extent of this increase must be attributed to good management, or otherwise, by the divisional managers. This increase in productivity is therefore due partly to controllable factors, and partly to uncontrollable.

W1 – Traceable net profit

	\$KL'000
Reported net profit	545
Add back: Allocated head office costs	360
Traceable net profit	905
Traceable net profit margin: (905/8,000)	11%

- (b) **Conclusion on payment of Export division manager's bonus**

The controllable net profit is arrived at after items which are not under the manager's control are added back. The net profit margin controllable by the manager of Export division is 10%. Given that it is difficult to assess the effect of the increased productivity on controllable net profit, the manager should be awarded her bonus for the year. This is because the controllable net profit margin of 10% exceeds the target of 8%.

W1 – Controllable net profit margin for Export division year ended 31 December 2016

	\$KL'000
Controllable net profit	
Reported net profit	545
Add back non controllable items:	
Depreciation	395

Allocated head office costs	360
Deduct currency gain (W2)	(522)
Controllable net profit	778
Controllable revenue	\$KL'000
Reported revenue	8,000
Deduct currency gain (W2)	(522)
Controllable revenue	7,478
Controllable net profit margin: (778/7,478)	10%

W2 – Currency gain

Six months revenue from 1 July 2016 was increased by 15% due to currency gain.

Six months revenue before currency gain $4,000/1.15 = 3,478$

Therefore non-controllable currency gain is $4,000 - 3,478 = 522$

As the exact increase in productivity resulting for the new machinery on Export division is unclear, it is difficult to accurately adjust the controllable net profit margin to reflect this. It would seem the divisional manager is benefitting from productivity improvements which are not entirely under her control. To reduce the controllable net profit margin to 8%, the threshold at which the manager is awarded her bonus, the net profit would have to fall by approximately \$KL179,760 ($778,000 - (7,478,000 \times 8\%)$). This is equivalent to 3.7% of cost of sales ($179,760k/4,800,000$). It is difficult to conclude, therefore, whether the 'significant' improvement in productivity would make the difference between the manager of Export division receiving her bonus or not.

(c) EVA™ as a performance measure for Export and Domestic divisions

EVA™ makes adjustments to the financial profit to calculate the economic value generated by each division, and then makes a deduction for the cost of the capital invested in the division. A positive EVA™ indicates a division is creating value above that required by those who finance the business. It is therefore consistent with JLW's objective to maximise shareholder wealth. Appraisal of divisional performance on this basis would therefore align the interests of managers with those of JLW's shareholders.

EVA™ involves making many adjustments to operating profit and capital employed. These may be time consuming, and be poorly understood by managers. The manager of Export division has already commented that she finds the bonus calculations difficult to understand. Failure of managers to understand the EVA™ calculations would make it difficult for them to work towards targets set for the division.

EVA™ avoids distortion from estimates and financial policies

EVA™ avoids the financial results from being distorted by accounting policies and estimates made by divisional managers, for example, the \$KL75,000 bad debt provision made in Domestic division, as increases in provisions are added back to operating profit in the EVA™ calculation. Whilst this provides a consistent basis to evaluate performance of divisions within JLW, EVA™ is not suitable for comparing divisional performance as it is an absolute measure and does not make allowance for their relative sizes.

EVA™ encourages managers to take a long-term view

The advertising costs for the new range of paints would be capitalised as these generate future value. The use of EVA™ would encourage managers to incur costs, such as these, which will benefit the business in the long term.

However, the calculation of EVA™ is backwards looking, and based on historical financial information, whereas shareholders need information about future performance on which to base their decisions.

EVA™ takes into account the cost of capital

The current performance measure of net profit margin is a poor measure as it takes into account neither the absolute net profit achieved, the capital employed in the division, nor the cost of capital. By making a deduction for the cost of capital employed in the division, the EVA™ calculation makes managers consider both the capital employed and the cost of capital in their divisions.

Export division is a profit centre and managers do not have control of investment decisions and hence it is not a suitable measure for the evaluation of the performance on Export division because there is no controllable capital employed. Domestic division is able to control investment decisions, and does have controllable capital employed, so EVA™ would be a suitable measure for evaluating Domestic division's performance.

However, to use the weighted average cost of capital (WACC) in the EVA™ calculation requires a number of assumptions and estimates to be made, for example, in calculating the cost of equity or market value of debt. The WACC is normally based on historic data, which may not reflect circumstances in the future, and may not be accurate.

Professional Level – Options Module

Advanced Performance Management

September/December 2017 – Sample Questions



Time allowed: 3 hours 15 minutes

This question paper is divided into two sections:

Section A – This ONE question is compulsory and MUST be attempted

Section B – TWO questions ONLY to be attempted

Present Value and Annuity Tables are on pages 12 and 13.

Do NOT open this question paper until instructed by the supervisor.

This question paper must not be removed from the examination hall.

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Think Ahead

ACCA

The Association of
Chartered Certified
Accountants

Section A – This ONE question is compulsory and MUST be attempted

- 1** Thyme Engine Products (Thyme) manufactures jet aircraft engines for the commercial aircraft market. This is a worldwide business although Thyme's production and development are all based in the country of Beeland. Thyme is a listed company and its stated overall objective is to be 'a world-class jet engine manufacturer trusted by our customers to deliver excellent products'. Its promise to its shareholders is that it will maximise their returns. The strategy to achieve this is to use world-class engineering to design engines and high quality production and customer service in order to drive profitable growth.

Thyme's share price has recently suffered as a result of the failure of a new engine design which led to large cash losses and a difficulty in obtaining new financing. There has also been a bribery scandal involving a senior manager and one of its key customers. As a result, a new chief executive officer (CEO) has been employed and she has begun a major review of systems at Thyme.

The first area which the CEO wants to examine is the information given to the board for strategic decision-making in both the planning and controlling of the business. The government of Beeland has been encouraging information sharing between businesses and has recently sponsored awards for management accounting. The winner of the engineering sector has produced a sample dashboard template (with dummy figures) for an annual review and this is given in Appendix 1. The CEO realised that the winner had a very similar overall objective and strategies to Thyme and wants to know what it is about this dashboard that helped it win the award. She does not want a new dashboard for Thyme at this stage but there may be some useful, specific comments to make about the contents of the dashboard given Thyme's recent problems.

The CEO has also recently been reading about integrated reporting and in the light of this review of the dashboard, the CEO has also asked for your views on how integrated reporting might impact on the type of information prepared by the company's management accountants.

As high quality engineering products lie at the heart of Thyme's competitive advantage, there has been a total quality management (TQM) approach to the management of all resources and relationships throughout the business. Thyme currently has a project under consideration to develop a new simple jet engine which would compete in the crowded market for small corporate jets. In order to compete in this market, it is believed that a target costing approach to this new engine would be beneficial. The CEO wants you to calculate the target cost gap for the new engine using the data in Appendix 2. Next, she wants to know how the use of target costing would fit within the existing TQM approach for this new engine.

The new engine project has further raised the profile of quality as a broad issue at Thyme and the CEO wants your advice on the costs associated with quality. She needs to know the cost of each of the four categories of quality costs. She has gathered data in Appendix 3 for this exercise. She is happy that she has identified that prevention costs are complete but is worried that some of the possible costs for the other three categories are missing and needs suggestions of cost areas to be examined to identify these missing items. Finally, she needs advice on the relative importance to Thyme of each of the four categories.

Required:

Write a report to the CEO of Thyme to:

- (i) Evaluate why the dashboard in Appendix 1 was award winning, as requested by the CEO.** (15 marks)
- (ii) Explain broadly the role of the management accountant in providing information for integrated reporting.** (6 marks)
- (iii) Calculate the target cost gap for the new engine (using the data in Appendix 2) and assess how the use of this target cost will fit within the TQM approach.** (12 marks)
- (iv) Categorise and calculate the costs of quality at Thyme (given in Appendix 3). Suggest cost areas to be examined as required by the CEO, and evaluate the relative importance of each category to Thyme.** (13 marks)

Professional marks will be awarded for the format, style and structure of the discussion of your answer. (4 marks)

(50 marks)

Appendix 1

Award winning performance dashboard

Report for the year to June 2017

	2015	2016	2017	Budget variance 2017	Growth 2016 to 2017	Budget 2018
Financial						
Revenue (\$m)	10,652	11,213	11,500	234F	2.6%	11,776
Operating profit margin	16.2%	16.8%	17.2%	0.2 percentage points F	0.4 percentage points	17.2%
EVA™	746	774	815	48F	5.3%	803
Total shareholder return	6.5%	6.8%	11.1%	4.5 percentage points F	4.3 percentage points	7.5%
Design						
Class leading products in:						
fuel efficiency	3	3	3	0		3
noise levels	2	2	3	1F		3
chemical emissions	1	2	3	1F		3
Manufacturing						
Percentage of orders right first time	92.0%	92.4%	93.7%	0.7 percentage points F		93.0%
Delivery						
Deliveries on time	88.0%	89.9%	88.2%	0.2 percentage points F		88.0%
Market share (as percentage of market leader)	33.0%	35.2%	38.1%	1.1 percentage points F		39.0%

Commentary:

The revenue growth of the business remains strong above the average growth for the sector of 1.5%.

EVA™ is positive and growing indicating increased shareholder wealth.

Healthy and continuing growth in market share reflects an increased number of class-leading products and improvements in 'right on time' service to customers.

There have been no major new business risks arising during the period while market volume growth continues as expected.

Appendix 2

New jet engine

	\$'000/engine
Competitor price	2,500
Raw materials	200
Subcomponents bought in	600
Skilled labour	625
General labour	125
Production overheads	275
Planned profit margin	15%

Notes:

1. Design and development has cost \$120m and the engine is expected to sell approximately 1,200 units over its lifetime.
2. Sales and marketing costs are expected to be approximately 20% of the selling price.
3. The planned selling price is expected to match the competitor's price with the brand reputation of Thyme providing the competitive edge.

Appendix 3

Quality costs identified in current year

	\$m
Repairs and replacements under customer warranties	223
Customer relationship management – complaint handling	56
Performance testing of final assembly	110
Performance testing of subcomponents from suppliers	28
Costs of re-inspection after repairs arising from final assembly testing	95
Training in quality control	11
Maintenance of inspection equipment	36

Notes:

1. The company spent \$92m in the year buying higher quality raw materials to use in manufacture.
2. The company's revenue was \$11,500m in the current year.

Section B – TWO questions ONLY to be attempted

- 2 Chicory operates a chain of depots in Deeland, supplying and fitting tyres and other vehicle parts to lorries, buses and agricultural vehicles. Chicory's objective is to maximise shareholder wealth. Due to a slowdown in the Deeland economy, Chicory's recent performance has been weak. An unsuccessful acquisition has also caused cash flow problems and a write-off of goodwill of \$24.7m in the year to 30 June 2017.

The board has commissioned a benchmarking exercise to help improve Chicory's performance. This exercise will involve comparison of a range of financial and other operational performance indicators against Fennel, a similar business in Veeland. Fennel has agreed to share some recently available performance data with Chicory as they operate in different countries. The reason Fennel was chosen as a benchmark is that as well as supplying and fitting tyres and parts to heavy vehicles, a large part of Fennel's business involves supplying electricity to charging points to recharge electric cars. Fennel installs and operates the charging points in public places, and users pay Fennel for the electricity they use. The board of Chicory intends to follow a similar business model as the use of electric cars is increasing in Deeland.

The Veeland economy is growing strongly. Electric car use there has increased rapidly in the last two years, encouraged by tax incentives for businesses, like Fennel, to install and operate charging points. The Veeland government has also underwritten loans taken out by businesses to finance this technology, which has enabled Fennel to borrow funds for the significant capital investment required. The cost of components used in the charging points is falling rapidly.

Capitalisation of development costs related to this technology is permitted in Veeland, but not in Deeland. In 2015, Fennel invested heavily in IT systems which significantly improved performance by increasing the availability of parts in its depots, and reducing inventories.

Chicory uses return on average capital employed (ROCE) as its main financial performance indicator, and this is to be benchmarked against Fennel. One board member suggested that, though it may have some disadvantages, EBITDA (earnings before interest, tax, depreciation and amortisation) could have advantages as a performance measure over the existing measure, and should also be included in the benchmarking exercise.

You have been given the most recently available financial data for both businesses in Appendix 1, with the data for Fennel being converted into \$ from its home currency.

Required:

- (a) Evaluate the relative financial performance of Chicory against Fennel using the two financial performance measures identified in the benchmarking exercise and evaluate their use as performance measures in this situation.
- (i) ROCE. (6 marks)
- (ii) EBITDA. (10 marks)
- (b) Advise Chicory on the problems of using the benchmarking exercise with Fennel as a way to improve performance. (9 marks)
- (25 marks)**

Appendix 1 Benchmark data (\$)

Extract from statement of financial position

	30 June 17	31 December 15
End of year	Chicory	Fennel ¹
Total assets	140·0	296·0
Current liabilities	(81·0)	(120·0)
Beginning of year ¹	Chicory	Fennel
Total assets	138·0	290·0
Current liabilities	(60·0)	(120·0)

Income statement

	30 June 17	31 December 15
	Chicory	Fennel
Revenue	175·1	350·0
Cost of sales	(130·1)	(299·0)
Gross profit	45·0	51·0
Administrative expenses	(11·0)	(25·0)
Write off of goodwill	(24·7)	—
Operating profit ²	9·3	26·0
Interest payable	(1·8)	(8·0)
Profit before tax	7·5	18·0
Tax	(3·0)	(1·0)
Net profit	4·5	17·0

Notes

¹ \$6m of new capital was introduced into Fennel on 31 March 2015. Normally, new net investment is spread evenly over the year.

² Operating profit is after charging depreciation of non-current assets of \$18m in Chicory, and \$25m in Fennel.

- 3** Rosemary and Rhyme Hospital (TRH) is a small hospital for the treatment of patients with only minor injuries. Patients arriving at TRH with more serious injuries are referred to a larger hospital nearby. Those with minor injuries are admitted into TRH and wait to be seen by a doctor. After treatment, most patients leave the hospital and need not return. If their treatment has failed, however, they are re-admitted for additional treatment.

Patients do not have to pay for treatment at TRH, which is a not-for-profit, public sector hospital. It is funded entirely by the government from taxation and a fixed level of funding is received from the government each year. It is up to TRH to allocate its funding to different areas, such as doctors' salaries, medicines and all other costs required to run a hospital.

TRH's objectives are:

- to give prompt access to high quality medical treatment for patients
- to provide value for money for the taxpayer, as measured by the '3Es' framework of economy, efficiency and effectiveness
- to contribute to medical science by developing innovative ways to deliver treatment to patients.

It has been suggested to TRH that the hospital has inadequate performance measurement systems in place to assess whether it is achieving its objectives, and that insufficient attention is given to the importance of non-financial performance indicators. You have been asked for your advice, and have met with some of the doctors to get their opinions.

One senior doctor has told you, 'I think TRH always delivers value for money. We've always achieved our total financial budgets. Doctors here work much longer hours than colleagues in other hospitals, often without being paid for working overtime. There is not enough government funding to recruit more doctors. At busy times, we've started referring more patients arriving at TRH to the larger hospital nearby. This has helped reduce average waiting times. Patients arriving at TRH are now seen by a doctor within 3 hours 50 minutes rather than 4 hours as was previously the case. So, we're already doing all we can. I don't know how much time we spend developing innovative ways to deliver treatment to patients though, as most of the performance data we doctors receive relates to financial targets.'

Recent performance data for TRH and national average information has been provided in Appendix 1. This is indicative of the data which the doctors at TRH receive.

Required:

- (a) Explain why non-financial performance indicators are particularly important to measure the performance of not-for-profit organisations such as TRH. (5 marks)
- (b) Justify one performance measure for each of the components of the value for money framework used at TRH and, using that measure evaluate whether TRH is delivering value for money. (10 marks)
- (c) Evaluate the extent to which the management style at TRH can be said to be budget constrained and advise on the implications of this approach for managing TRH's performance. (10 marks)

(25 marks)

Appendix 1

Data for the year ended 31 August 2017

	TRH	National average ¹
Number of doctors	25	24
Total doctors' salaries including overtime	\$3.75m	\$4.20m
Total doctors' salaries budget including overtime	\$3.75m	\$3.20m
Number of patients treated	24,375	20,000
Average staff satisfaction rating ²	9%	89%
Number of patients re-admitted	1,830	300

Notes

¹ National average for other public sector minor injuries hospitals.

² Staff satisfaction rating was obtained by conducting a survey of all 25 doctors. A survey score of 100% represents 'totally satisfied', and a score of 0% represents totally unsatisfied.

- 4** Sweet Cicely (SC) manufactures sweets and confectionery and has delivered stable but modest increases to the shareholder wealth for many years. Following a change in ownership, the new shareholders are keen to increase the long-term performance of the business and are prepared to accept a high level of risk to achieve this.

SC is considering setting up a factory to manufacture chocolate bars. There are three options (1, 2 and 3) for the size and output capacity of the new chocolate factory. SC must choose a size most suited to the expected demand for its products. As well as the impact of the quality, branding and pricing of its products, demand for SC chocolate bars will be influenced by external factors such as consumer tastes for chocolate over other sweets, and even the suggested health benefits of certain types of chocolate.

A high-cost ingredient in chocolate bars is cocoa, a commodity traded on international markets. The market price of cocoa fluctuates with worldwide demand. Due to economic growth, chocolate consumption is rising in many countries, where it was once considered a luxury. In some countries, however, governments are considering introducing additional taxes on products containing sugar in order to reduce the consumption of chocolate and confectionery products. Being derived from an agricultural crop, the availability and price of cocoa is also influenced by climatic conditions, soil erosion, and disease. Conflicts and political instability in cocoa growing regions can also restrict its availability. Recent technological advances in the production of cocoa, such as the use of genetically modified crops, promise higher yields from cocoa plants in the near future.

You have been asked to help SC choose one of the three options for the new chocolate factory. One board member told you: 'The board proposed expanding into cake manufacturing several years ago. With hindsight, our planning on that proposal was poor. We sold only slightly fewer cakes than expected, but hadn't realised how sensitive our operating profit would be to a small change in demand. The previous shareholders thought problems in the cake business would put their dividends at risk, so SC stopped manufacturing cakes, barely a year after it started. The board does not want to repeat these mistakes. We want to minimise the opportunity cost of making the wrong decision about the size of the new chocolate factory.'

Appendix 1 shows the net present values for the three options discounted at SC's current cost of capital. Appendix 2 shows the expected operating profit generated by the three options in the first year of the project, according to the market price of cocoa, and assuming an annual demand of 70 million chocolate bars.

Required:

- (a) Advise SC why decisions, such as what size of chocolate factory to build, must include consideration of risk and uncertainty, and evaluate the use of PEST analysis in managing the risk and uncertainty surrounding the project.** (14 marks)
- (b) Using the data in Appendix 1, explain which of the three options for the new chocolate factory would be preferred by the board and the new shareholders according to their respective risk appetites.** (6 marks)
- (c) Using the data in Appendix 2, recommend which of the three options for the new chocolate factory a risk neutral investor would choose, and explain any problems with the approach used to make the choice.** (5 marks)

(25 marks)

Appendix 1

Net present values for the three options discounted at SC's current cost of capital (\$m)

	Option 1	Option 2	Option 3
Annual demand for chocolate bars			
50 million	4.0	(8.0)	(32.0)
60 million	6.0	16.0	(24.0)
70 million	6.0	16.0	17.0

Appendix 2

Expected operating profit generated by the three options in the first year of the project, assuming an annual demand of 70 million chocolate bars (\$m)

Probability	Market price of cocoa (\$ per ton)	Option 1	Option 2	Option 3
0.3	2,500	3.0	5.0	7.0
0.4	3,000	0.5	2.0	1.5
0.3	3,500	(2.0)	(1.0)	(2.0)

Answers of Above Question Paper

Professional Level – Options Module, Paper P5
Advanced Performance Management

September/December 2017 Sample Answers

- 1 To: CEO of Thyme
From: A Accountant
Date: September 2016
Subject: Reporting performance and quality issues at Thyme Engine Products

This report analyses the positive features of the award winning dashboard identifying some areas which specifically apply to Thyme. The role of the management accountant in providing information for integrated reporting is explained. Then, the target cost gap for the new engine is calculated and an evaluation is provided of the use of this target cost within the TQM approach. Finally, issues associated with the costs of quality at Thyme are addressed.

(i) **Positive features of the award winning dashboard**

The following are features of the dashboard which will have weighed in the assessors' minds when making the award. They are placed in a priority order of most important first and then there are a few specific comments about the possible use of such a template at Thyme.

Achievement of the objectives and strategies of the business

The critical measure of whether the dashboard is fit for its purpose is whether it answers the question: has the business achieved its key objectives?

The dashboard measures all of the key objectives of the business growth of the firm:

1. shareholder wealth and returns through EVA™ and TSR; and
2. growth through revenue and market share growth.

It also measures the strategies used to achieve these results:

1. world-class engineering to design engines through the class leading design specifications;
2. high quality production through fault rates in manufacturing and delivery; and
3. customer service through those same fault rates and market share (an indirect indicator).

Balanced view

The report presents a balanced view of the business's performance. It deals with various perspectives (shareholders (TSR), customers (market share), internal business (fault rates) and innovation (design position)) which are used in the balanced scorecard approach. This is also achieved using both internal and external data (fault rates and average sector growth). It presents both the results and the determinants of those results by giving financial and non-financial indicators. For example, revenue growth will be driven by the customers' view of product and service, so design and manufacturing quality measures are important. Short and longer term measures are given such as profit margin and economic value added.

Planning and control

The dashboard should allow the board to perform both its vital functions in planning and controlling the business. The forecasts for next year (budgets) are given and also, as noted above, there are non-financial determinants of performance such as design and customer service which will drive the future short-term competitive position of the business.

The control activities of the board are served by providing historic trends and also current budget variances. The major headings are provided for under the financial headings with activity measured by revenue, profit by the margin and shareholder wealth by economic value added.

Presentation

The dashboard is kept brief as the board will have an opportunity prior to the board meeting to use it to identify issues requiring further analysis at the meeting. There is a short narrative commentary which deals with the major commercial points arising from the dashboard and also, gives further external market data as context for the figures (e.g. average sector growth). It is also worth noting that the narrative picks up on strategic issues of risk and opportunity which can more difficult to capture in numerical form. Hence, the commentary appears appropriate to assist in an annual review of the business.

Specific issues at Thyme

There are certain issues particular to Thyme which may be added to the example dashboard, though if these are deemed short term, then they may not necessarily appear on this main dashboard view. The example dashboard does not show measures of cash flow performance (such as free cash flow generated) nor gearing ratio, both of which would be important for future fund raising. There are no measures associated with governance and ethics which in the light of the bribery scandal may have a higher priority at Thyme. Ethical training costs may give a measure of this area.

(ii) Integrated reporting

There is no standard format for integrated reporting. However, there are changes in focus of the company's reporting which will require the input of the management accountants of that business. Integrated reporting has a focus on opportunities and risk, how resources are allocated and performance both recent historic and expected in the future. There are six capitals involved in value creation including traditional tangible and financial assets but also including human, intellectual, environmental and social assets.

For the management accountant, these newer forms of capital will require information systems capable of capturing and processing such non-financial measures. The forward-looking nature of such reporting will require more information of a forecast nature (with the accompanying requirement to understand their estimating assumptions). The more strategic view which integrated reporting intends to give also requires reporting on factors which drive long-term performance. A key part of the integrated report is linking performance to strategic goals and the ability to create value. This will require a less structured and more contingent approach to reporting. In other words, proforma reporting must be better tailored to the specific business's situation. However, it is considered a key requirement of such reporting that it is concise and so the management accountant must help to ensure that only the key information is reported. It can be seen that the dashboard discussed in the above section of this report achieves many of these requirements.

(iii) New jet engine: target costing and TQM

Workings:

	\$'000
Target cost	2,125
Production costs	1,825
Design and development	100
Sales and marketing	500
Current cost	2,425
Target cost gap	300 (12% of current cost)

The target cost for the new engine is \$2.125m and the current estimated cost is \$2.425m. Therefore, there is a need to cut costs by 12% to achieve the target profit margin. It is common for the initial costs to be higher than the target cost and for cost savings to be achieved as the product reaches maturity in its lifecycle. It should be noted that even at this higher initial cost, the engine will be making a small \$0.075m profit per unit (a 3% margin).

Target costing involves setting a selling price based on what will be competitive in the market then deducting a target profit margin to obtain the target cost. An estimate is made of the cost of the engine based on the current design specification. The gap between this cost and the target cost is the target cost gap and opportunities to bridge this gap are sought by amending the product design or cutting costs in production.

Total quality management (TQM) is a management approach which seeks to have no defects in resource or relationship management. It aims to have a culture of continuous improvement in the organisation.

In this new engine project, the TQM philosophy will fit well with the need to cut a relatively small amount of costs in order to meet the target. By small but frequent improvements as the production team climb the learning curve associated with such a new product, it would be expected that such cost savings would be made.

Given the size of the cost gap, it does not seem that a major redesign of the engine is required.

(iv) Quality costs

There are four categories of quality costs:

- Prevention costs are costs to prevent the production of engines which fail to meet specifications;
- Appraisal costs are costs incurred in inspecting products to ensure that they meet specifications;
- Cost of internal failure are costs associated with making good products which are identified as sub-standard before delivery to the customer; and
- Cost of external failure are costs associated with making good products which are identified as sub-standard after delivery to the customer.

Working:

	\$m
Prevention	139 (= 11 + 92 + 36)
Appraisal	138 (= 110 + 28)
Costs of internal failure	95
Costs of external failure	279 (= 223 + 56)
Total	<u>651</u>

Comments on results

The total quality costs are 5.7% of revenue which seems surprisingly low for an organisation which recognises this as a key competitive advantage; notable is the large size of the external failure costs of 2.4%.

Possible other relevant costs

Overall, there are likely to be administrative costs associated with many of these categories and some attribution of overhead should be undertaken beyond the customer complaint handling mentioned.

Appraisal costs include performance testing of final assembly and performance testing of subcomponents from suppliers. There may also be costs associated with inspection of raw materials inward since these make a difference to quality (shown by the higher purchase costs).

Internal failure costs include costs of re-inspection after repairs after final assembly testing. There must also be costs associated with repairing faulty goods identified at final testing and possibly also scrapping failed products. It is possible that there is idle time costs due to work held up by internal identification of faulty products.

External failure costs include customer complaint handling and replacements under warranties. There is also the cost of damage done to Thyme's brand by such problems although many customers will accept that these are inevitable and provided they are infrequent and covered by warranty, they need not be important.

New products such as the new jet engine will likely generate additional failure costs while production methods are optimised.

Relative importance of categories

Given the high cost of external failure and the importance of reputation for Thyme, the most important category is prevention. It would be appropriate for Thyme with a TQM approach to be spending heavily in this area. This will still need to be combined with warranty spending in order to protect the reputation of Thyme when problems do occur. As prevention succeeds, so the importance of the other categories will decline. It is worrying that external failure costs are more than twice internal failure costs, which suggests that final testing is not identifying a significant number of the faults in production.

2 (a) (i) ROCE

As can be seen in working 1, Chicory's ROCE is 13.6% and Fennel's ROCE is 14.9%. Fennel has apparently performed better than Chicory. One benefit of using ROCE as a performance measure in this benchmarking exercise is that it gives a percentage figure and can compare businesses of different sizes. ROCE does not, however, give the absolute level of return. In this case, Fennel has both a higher capital employed and a higher percentage return.

ROCE is easy to calculate and will be familiar to Chicory's management as it is currently one of Chicory's main financial performance indicators. The figures required to calculate ROCE are readily available from published data, which makes this a good financial performance measure for benchmarking.

ROCE shows a weak correlation with Chicory's objective to maximise shareholder wealth, which may limit ROCE's usefulness as a performance measure in this benchmarking exercise. ROCE may be distorted by accounting policies or where different businesses have different levels of intangible assets. This may lead to drawing incorrect conclusions from the exercise. A big disadvantage of using ROCE in this benchmarking exercise is that it may encourage managers not to

invest in new non-current assets, which contradicts Chicory's strategy of investing in charging points.

Working 1

Chicory:

Opening capital employed (Total assets – Current liabilities)	\$78.0m (138.0 – 60.0)
Closing capital employed	\$59.0m (140.0 – 81.0)
Average capital employed	\$68.5m ((78.0 + 59.0)/2)
ROCE (Operating profit/average capital employed)	13.6% (9.3/68.5)

Fennel:

Average capital employed (170 x 0.25) + (176 x 0.75)	\$174.5m
ROCE	14.9% (26.0/174.5)

(ii) EBITDA

Using Chicory's main financial performance indicators of ROCE, Fennel has performed better than Chicory. When depreciation of non-current assets and the write-off of goodwill in Chicory are added back to operating profit to calculate EBITDA, Chicory's performance, with an EBITDA of \$52.0m, is slightly better than that of Fennel, which has an EBITDA of \$51.0m.

EBITDA as a proxy for cash flow

EBITDA is easy to calculate from published data, and easy to understand. It is a measure of underlying performance, as it is a proxy for cash flow generated from operating profit. As Chicory is having cash flow difficulties following the unsuccessful acquisition, EBITDA would be a relevant measure for this benchmarking exercise. EBITDA does not, however, take into account the cash flow effect of working capital changes, for example, by Chicory negotiating longer payment terms with its suppliers.

Excludes items which are not relevant to underlying performance of the business

Tax and interest are distributions from profits, unrelated to the underlying performance of the business. Excluding them from measures of performance, therefore, gives a better understanding of the underlying performance of Chicory and Fennel. This is important for the benchmarking exercise since Fennel appears to suffer much lower rates of tax, probably due to the tax incentives given by the Veeland government. Loans underwritten by the Veeland government may be at artificially reduced rates of interest and should also be excluded when measuring performance.

Similarly, depreciation, amortisation and write-offs such as goodwill are not relevant to the current year's underlying performance and may relate to previous years. For example, adding back the write-off of goodwill in Chicory means the two businesses have identical EBITDAs, albeit that Fennel has much greater capital employed.

EBITDA affects comparability of the benchmarking data

Using EBITDA as a performance measure in the benchmarking exercise makes the data for the two businesses more comparable and removes one element of subjectivity, such as in determining useful economic lives of non-current assets. EBITDA does, however, ignore the replacement costs of these assets. This might limit the usefulness of comparisons between Chicory and Fennel if one were to lease non-current assets and the other to purchase them. The introduction of a new accounting standard on the treatment of leases may, however, remove this limitation.

Unlike Chicory's existing measure of ROCE, which is a percentage measure, EBITDA is an absolute measure and so makes it difficult to compare businesses of different sizes. As a profit based measure, its usefulness is also limited by subjective assumptions made in the calculation of profit, or by inconsistent accounting policies. Development costs may be capitalised in Veeland, but not in Deeland, which may make a comparison against the benchmark difficult.

Working 2

EBITDA \$m	Chicory	Fennel
Operating profit	9.3	26.0
Add back:		
Depreciation on non-current assets	18.0	25.0
Write off of goodwill	24.7	–
EBITDA	52.0	51.0

- (b) Benchmarking the performance of Chicory against a similar business implies that there is a best way to operate. Though Fennel may be similar to Chicory, there is no indication that it is best in class and benchmarking against it may be inappropriate.

For example, Fennel has taken advantages of tax incentives and loan guarantees to finance new investments. These do not exist in Deeland, so Chicory may be unable to fund investment in this way. It may have to consider leasing assets instead, or accept a slower rate of growth if it wishes to set up charging points in Deeland.

Benchmarking is a catching up exercise. The financial data for Fennel is 18 months older than that for Chicory and may already be out of date. In 2015, Fennel improved operational performance by investment in IT. The effect of this is not reflected in the financial data given. Benchmarking performance against historical data may not be relevant for current or future performance. The electric car market in Veeland has grown rapidly in the last two years. This growth is not reflected in the financial performance data given for Fennel, nor is the falling price of components for the charging points.

Though Fennel has agreed to share data, this data may be inaccurate or misleading. Though initially the benchmarking exercise is only against Fennel, it may be difficult to find other comparable businesses to benchmark against in the future. The data required for calculation of the three financial performance indicators used in the benchmarking exercise is likely to be readily available and audited, however, which means it is reliable.

A large part of Fennel's business relates to providing charging points for charging electric cars. Though this is a business model Chicory intends to follow in the future, it is very different to its existing business, and so benchmarking against Fennel may be misleading unless more detailed data relating to the two activities can be obtained.

Similarly, Fennel operates in a different country, where the economy is much stronger. Performance targets set following the benchmarking exercise may be unachievable for Chicory. Fennel's financial data has been converted into \$ from its home currency. Movements in exchange rates may make the benchmarking data less comparable, especially if the economies in Deeland and Veeland are growing at different rates.

3 (a) Lack of profit-making objective

Not-for-profit organisations do not, by definition, have profit as an overriding motive. Patients are not charged for receiving treatment, so TRH does not have a revenue stream. It may also be difficult to define a cost unit as this could be cost per patient arriving at hospital or cost per patient successfully treated.

Not-for-profit public sector organisations, such as TRH, have strict constraints on the amount of funding they receive, such as a fixed amount of funding received entirely from the government. They cannot obtain funding from elsewhere, so financial measures cannot be ignored completely. TRH must exist within its financial means, and the use of budgets to control costs is critical.

TRH provides an essential public service. Political, legal and social influences would prevent it from closing down a service just because it became more expensive or uneconomic to provide it. For all of these reasons, financial objectives are less relevant than for most commercial organisations, and its objectives are mainly non-financial in nature.

Not-for-profit organisations also undergo more public scrutiny and have multiple stakeholders, so non-financial indicators will be necessary to manage expectations. For example, patients are stakeholders who will have relatively little interest in how TRH exists within its financial constraints. They will have much more interest in non-financial performance, such as how quickly and successfully they are treated.

Multiple objectives

Not-for-profit organisations have multiple objectives, and it may be unclear which are the most important. Except for some aspects of giving value for money to the taxpayer, TRH's objectives are all non-financial.

The outputs or benefits of the services provided are non-financial in nature, for example, giving prompt and high-quality treatment to patients. Therefore NFPIs are required to measure performance.

- (b)** Value for money in public sector organisations can be measured using the 'three Es': economy, efficiency and effectiveness.

Economy

Economy means obtaining resources at the lowest cost. Doctors' salaries will be a significant expense for TRH, and salary per doctor is a suitable measure of economy. Doctors at TRH have an average salary of \$150,000 (\$3.75m/25), compared to the national average of \$175,000 (\$4.20m/24).

The relatively lower salaries of doctors may be due to differences in levels of experience or that they work unpaid overtime. It may also be one of the reasons why the staff satisfaction is so much lower at 9% compared to the national level of 89%.

Efficiency

Efficiency relates to obtaining the greatest possible outputs from the resources available. Treating patients is a key objective of TRH, and the number of doctors is an important resource. The number of patients treated per year by each doctor is a good measure of efficiency. In TRH, each doctor treats an average of 975 (24,375/25) patients per year, 17% more (975 v 833) than the national average 833 (20,000/24). This may be because they work longer hours than their colleagues in other hospitals.

Effectiveness

Effectiveness means how well TRH achieves its objectives. TRH has multiple objectives, one of which is to provide high quality medical treatment for patients. Where patients are re-admitted to TRH because their treatment had failed, this represents a failure to provide high-quality medical care, so the rate of re-admission of patients is a measure of effectiveness. The rate of re-admission at TRH is 7.5% (1,830/24,375), much higher than the national average of 1.5% (300/20,000). TRH seems to have performed relatively very poorly in this respect.

Summary

Overall, the results from the measurement of the 3Es are consistent with the doctor's comments that they are working without being paid overtime and treating more patients than their colleagues in other hospitals. TRH appears to deliver better economy and efficiency than the national average. This seems to be reducing performance, however, in respect of providing high-quality medical treatment for patients, where TRH is less effective than the national average.

(c) Extent to which the management style is budget constrained

A budget-constrained management style emphasises the need to achieve short-term performance measures, for example, the annual financial budgets.

The doctor said that TRH has always achieved its total financial budgets, and this is supported by the fact that the doctors' salaries for the year to 31 August 2017 equalled the budget set for the period. Though it is unclear what NFPIs are measured at TRH as a whole, doctors receive only a limited set of financial and non-financial performance data. The discussion about this data, however, is mainly related to financial targets. This implies greater emphasis is given to performance against financial targets, rather than non-financial ones.

All of this suggests that TRH has a budget-constrained management style. An advantage of this is that it ensures TRH operates with the financial constraints of the fixed amount of funding received from the government.

Implications of a budget-constrained approach at TRH

This management style encourages short-termism, by encouraging doctors to work long hours without being paid overtime, or not making funding available to recruit new doctors to alleviate the situation. An implication of this is that TRH may reduce its performance against its objectives, and this is already seen by the relatively high rates of re-admission as an indicator of a reduced quality of medical treatment. Job-related tension is a consequence of a budget-constrained management style, and the low staff satisfaction score could have resulted from this.

This management style encourages manipulation of results, or the way they are measured, to show better performance. At busy times, more patients are referred to the nearby larger hospital. There is apparently no medical need for this, which is inconsistent with the objective to deliver high-quality treatment. It appears to be a way to distort waiting times to demonstrate improved performance in treating patients promptly. From patients' perspective, though, this will mean they are treated less promptly than if treated at TRH.

Being unable to recruit new doctors reduces TRH's flexibility in reducing waiting times at busy periods, as the steps already taken seem to have had minimal effect. This management style does not encourage innovation, probably because doctors have insufficient time for this. Though this may have long-term benefits, it seems to be taken as less important than the other key objectives, to provide prompt, high-quality treatment.

4 (a) Importance of incorporating risk and uncertainty in making long-term decisions

Risk relates to the variability of outcomes, the probabilities of which are known, or can be estimated. Uncertainty occurs where the outcomes and their probabilities are unknown. The variability of demand for SC's chocolate bars is a risk, and the probabilities of different levels of demand can be estimated. The outbreak of conflict in a cocoa growing region affecting cocoa prices cannot be assigned a probability, and so is an uncertainty.

The market price of cocoa and the demand for chocolate bars are examples of exogenous variables which significantly affect the performance of SC. Exogenous variables arise from outside the business, but over which the business has no control. Climatic conditions, soil erosion, for example, all affect the price of cocoa, and therefore the performance of SC.

When investors evaluate businesses, they take into account prospective returns and the level of risk involved. Therefore, managers should consider risk and return when evaluating projects on their behalf. Long-term strategic planning requires forecasts to be made about future events, such as the price of cocoa. These future events are by definition unknown, and subject to risk and uncertainty. Risk and uncertainty must, therefore, be considered when making long-term plans, such as opening the new factory. The further into the future the plans project, the riskier, and more uncertain, events are likely to be, as it is harder to predict what conditions will be. This means consideration of risk and uncertainty is even more important when making long-term decisions than for short-term decisions.

Use of PEST analysis

To incorporate risk and uncertainty into long-term strategic planning, SC must identify and monitor the most important exogenous variables, taking action to manage the risks they present. As a traded commodity, the risks of rising cocoa prices could be managed (hedged), for example, by using cocoa futures. The board member's comments suggest planning for the cake business was poor, and did not adequately consider the importance of exogenous variables. Risks in the macro environment could be identified using a PEST analysis.

Political factors

The market price of cocoa is affected by conflicts and political uncertainty, so consideration of these external factors is needed to incorporate risk and uncertainty into long-term planning. By identifying factors such as political instability or conflict, SC can improve its long-term performance by sourcing cocoa from more stable regions. The political situation in a region can change rapidly, which might make it difficult to incorporate these risks into long-term planning, as there is a high degree of uncertainty.

The introduction of increased taxes on products containing sugar is a political factor affecting the long-term demand for SC's products. Once introduced, this factor is likely to operate in the long term and be more predictable. Identifying this, SC could develop products containing less sugar and so reduce the amount of these additional taxes on its products.

Economic factors

Economic factors such as the variation in long-term interest rates can influence SC's performance by affecting exchange rates or overall consumer demand. By identifying these factors, SC could hedge against currency exchange rates. In the longer term,

SC could locate its operations in a country where the risks from exchange rate fluctuations are lower, or diversify geographically to spread the risk.

Social factors

Overall demand for chocolate products will be influenced by social factors such as consumer tastes or increased awareness of healthy eating. SC can improve its long-term performance by not investing in a chocolate factory at all, if it believes demand for its products will fall sufficiently to make the venture unprofitable.

Technological factors

The increased cocoa yields from genetically modified crops may reduce long-term cocoa prices and SC could incorporate this into the net present value calculations for the factory. There may be unpredictable consequences which are harder to plan for, such as the acceptance by consumers of genetically modified foods.

(b) Board

The board wants to minimise the opportunity cost of making the wrong decision about the size of the new chocolate factory, which means to minimise the regret of making the wrong decision. The minimax regret rule would be the appropriate method to use so they would choose the project with the lowest maximum regret.

The regret table is as follows:

	Option 1	Option 2	Option 3
Annual demand			
50 million	0	(12·0)	(36·0)
60 million	(10·0)	0	(40·0)
70 million	(11·0)	(1·0)	0·0
Maximum regret	(11·0)	(12·0)	(40·0)

Option 1 is the option with the lowest maximum regret (\$11m), and that would be the option preferred by the board according to their risk appetite. A drawback of using the minimax regret rule is that the probabilities of the outcomes are not considered.

New shareholders

The new shareholders are keen to increase the long-term performance of the business and are prepared to accept a high level of risk to achieve this. They will choose the option with the maximum possible outcome, which is option 3, with a maximum possible net present value of \$17m. This is known as the maximax rule. This also takes no account of the probabilities of the outcomes, and also tends to be over-optimistic. It also ignores the fact that even risk seekers have a risk–return trade off.

(c) Expected value of each option

$$\text{Option 1} - (0.3 \times 3.0) + (0.4 \times 0.5) + (0.3 \times -2.0) = \$0.5\text{m}$$

$$\text{Option 2} - (0.3 \times 5.0) + (0.4 \times 2.0) + (0.3 \times -1.0) = \$2.0\text{m}$$

$$\text{Option 3} - (0.3 \times 7.0) + (0.4 \times 1.5) + (0.3 \times -2.0) = \$2.1\text{m}$$

The risk neutral investor's choice, for year 1 only, would be option 3, with an expected value of \$2.1m.

Problems of using an expected value approach

A risk neutral investor would use the expected value approach to choose between the three options. The expected value is a long run average, and is only appropriate where a decision is repeated many times. This does not appear to be the case at SC which has made only one attempt at strategic expansion in the last several years. For the same reason, the expected value will not equal the actual outcome.

Determining the probabilities, of the market price of cocoa for example, is subjective. Even analysis of historical market prices is not necessarily a guide to what will happen in the future. The expected value approach is suitable for a risk neutral investor. This does not apply to the key stakeholders at SC, and hence this approach is inappropriate for use in the decision on the three options. Determining the payoffs is also difficult when demand is subject to uncertainty. SC should not make a decision on the factory based only on the first year's operating profits, and should take a longer term view, for example, based on discounted cash flows.

Professional Level – Options Module

Advanced Performance Management

March/June 2018 – Sample Questions



Time allowed: 3 hours 15 minutes

This question paper is divided into two sections:

Section A – This ONE question is compulsory and **MUST** be attempted

Section B – TWO questions **ONLY** to be attempted

Present Value and Annuity Tables are on pages 9 and 10.

Do NOT open this question paper until instructed by the supervisor.

This question paper must not be removed from the examination hall.

Paper 5

Think Ahead

ACCA

The Association of
Chartered Certified
Accountants

Section A – This ONE question is compulsory and MUST be attempted

- 1** Chiven Stores (Chiven) is a listed clothing retailer in Beeland. Its overall aim is 'to become the largest clothing retailer in Beeland and deliver exceptional value to its shareholders'. It has recently dropped down the clothing retailer rankings from fourth to fifth largest. Shareholders have expressed concern at the lack of dividend growth at a time when spending in the Beeland clothing market has been growing.

There has been a recent change of chief executive officer (CEO) and the new CEO has identified that the performance reporting at Chiven is not fit for the needs of the business. She has asked you to prepare a report to the board to address the performance measurement and management issues which she sees as most important. Her plan is to achieve the overall aim by 'maximising our opportunities from new technology and increasing our currently small web presence'. She wants a detailed evaluation of the current performance report which is used by the board for its annual review of the business (Appendix 1). She wants this task split into two parts: first, evaluate the existing set of measures and their presentation and then second, add three new measures which you believe address key issues for the business but are not currently on the report. She has stated that the report does not need a commentary as she and the finance director talk through the report in detail with the board.

In an additional effort to drive improvement and gain competitive advantage for Chiven, the board has decided to use the value chain as a business integration tool. The CEO has provided a copy of the value chain diagram which was discussed at the last board meeting (Appendix 2). She believes that further improvements in Chiven's performance can be achieved through simplification of the supply chain. The CEO believes that this has implications for the performance measurement and information systems at Chiven and wants your report to address this as well.

Finally, the CEO has already identified one important reason for Chiven's poor performance and that is its failure to make use of 'Big Data' in relation to Chiven's web sales. She believes that the board does not understand the implications of the volume, velocity and variety of this data for the business and wants you to write a guide for them. She is aware that this is a new and rapidly developing area for most businesses, so she considers that the board should also be briefed about its risks and challenges.

The CEO wants a report which she can present to the board to address these various performance issues at Chiven.

Required:

Write a report to the board of Chiven to:

- (i) Evaluate the performance report in Appendix 1 as requested.** (20 marks)
- (ii) Using the data in Appendix 1, recommend (with appropriate calculation and justification) three new performance measures for Chiven as requested.** (8 marks)
- (iii) Advise on appropriate performance measures and systems for Chiven when using the value chain approach to simplify the supply chain.** (7 marks)
- (iv) Discuss the development of Big Data and its potential impact on Chiven's information systems, including the risks and challenges it presents.** (11 marks)

Professional marks will be awarded for the format, style and structure of the discussion of your answer. (4 marks)

(50 marks)

Appendix 1

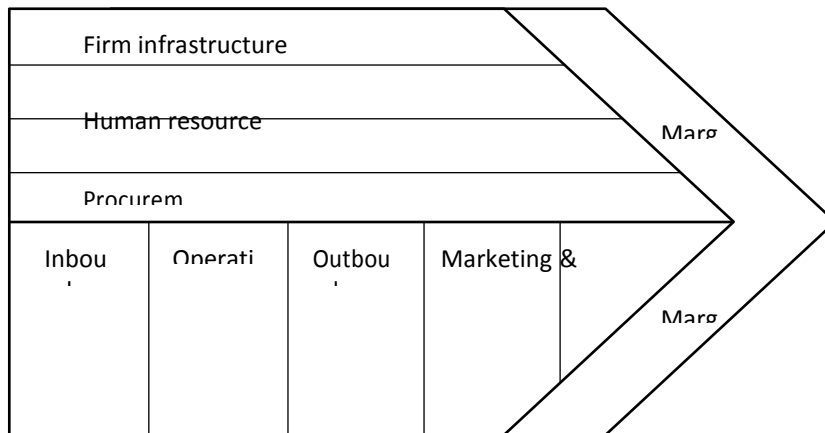
Chiven Stores

Annual performance report for year ended March 2018

						2018	2017
						Total	Total
Revenue (\$m)	Region	A	B	C	Total		
Clothing							
	Men's	178	356	178	712		
	Women's	297	593	297	1,187		
	Children's	119	237	119	475		
	Total	594	1,186	594		2,374	2,351
Other							
	Men's	19	39	19	77		
	Women's	32	65	32	129		
	Children's	13	26	13	52		
	Total	64	130	64		258	255
Total						2,632	2,606
						2018	2017
						Total	Total
Operating profit margin (%)	Region	A	B	C			
Clothing							
	Men's	15.5	15.7	15.2			
	Women's	16.2	16.3	15.9			
	Children's	18.1	18.3	18.0			
Other							
	Men's		15.5	15.8	15.2		
	Women's		16.2	16.4	15.8		
	Children's		18.1	18.2	17.8		
Overall							
						16.5	16.5
Number of stores						542	540
EPS (\$)						0.56	0.56
Dividend per share (\$)						0.28	0.28
EVA™ (\$m)						21	24
Inventory turnover rate (days)						32	32
Average number of product lines bought per supplier						66	64
Floor space (square metres)						850,000	828,000
Market share (%)						9.8	10.1
Number of employees						40,500	39,400
Number of suppliers						161	161
ROCE (%)						8.3	8.5
Number of accidents in stores						256	255
Average queuing time for customers (seconds)						125	128
WACC (%)						5.8	5.7
Average time between customer entry and employee greeting (seconds)						248	232
Inventory obsolescence/loss write-downs (\$m)						25	25

Appendix 2

Value chain diagram



Section B – TWO questions ONLY to be attempted

- 2 Luvij manufactures high quality, luxury women's footwear. It sells its products on its own website and also to small independent retailers. In order to monitor performance and aid decision-making, Luvij collects sales data on all of its footwear ranges and feedback on its designs from customers and retailers. In addition, to ensure that prices remain competitive, Luvij has a team of staff to monitor the prices of similar products on competitors' websites and to identify design trends in the market, which change frequently, and from season to season. Generating new footwear designs consistent with changing market trends is a critical success factor for Luvij. The large volume of data collected is entered into a complex spreadsheet by one data entry clerk.

Luvij operates a functional structure with different departments for sales, production, purchasing and design. The spreadsheet is sent by email to the senior manager of each of these departments at the end of each quarter. The senior manager for the sales, production and buying departments are expected to generate the relevant sales, production and purchasing forecasts by analysing information contained in the spreadsheet. The senior manager of the design department uses the information to generate new footwear designs consistent with market trends.

Luvij has a strategic objective to become the market leader in the sale of high quality, children's footwear to small independent footwear retailers. It has already invested heavily in market research and developing innovative designs. To reduce the risks of not achieving this strategic objective, for example, by having insufficient capacity to produce a larger range of footwear styles, the board is considering entering into a joint venture with Shirville.

Shirville is a large manufacturer of exclusively children's footwear. Its advanced manufacturing machinery and production techniques mean that it can produce the high volumes required to supply supermarkets and chain stores* found on the main streets of most towns and cities. Shirville's objective for the joint venture is to utilise spare production capacity it has in a factory which it holds on a lease which expires in three years.

One recently appointed board member at Luvij has commented, 'I believe that the external information on market trends and competitors' prices compiled in the quarterly spreadsheet is of limited usefulness as I have heard complaints from managers that they have difficulty understanding the large volume of data given to them, and that they often receive this too late. The company I worked for in my previous job used a unified corporate database to share information in real time across all parts of the business. A similar unified corporate database may be useful for Luvij. I am also concerned about the potential problems of measuring and managing the performance of the joint venture with Shirville. The fact that the two businesses have different objectives is just one example of why these problems may occur, though there will also be other reasons.'

*Chain stores are large retailers with multiple stores based in different locations.

Required:

- (a) Explain the factors which might limit the usefulness of the external information currently used by Luvij, and evaluate how the use of a unified corporate database could help to overcome these limitations. (15 marks)

- (b) Advise the board on the potential problems with the measurement and management of the performance of the joint venture with Shirville.** (10 marks)

(25 marks)

- 3** Bazele hires out plant and machinery to small firms working in the construction industry. Bazele's senior managers, including the chief executive officer (CEO), have worked in the business since it was established 30 years ago, and they own the majority of the shares. During that time, Bazele has acquired many smaller plant hire businesses. Of these business units, those which have underperformed after acquisition have either been sold on or restructured, for example, to increase their operating margins. Bazele has recently diversified by hiring out large items of plant to large construction firms working on major infrastructure projects. These projects can last for up to 10 years. Strong growth in the general economy has increased the number of these large projects and has also led to a predicted large increase in bank interest rates.

The shareholders' objective is for Bazele to maintain its historic return on capital employed (ROCE). Managers at business units are given the objective of maintaining net profit margins of their own business units. Similarly, managers at individual branches of business units are given the same objective according to their own areas of responsibility.

Following two years of poor performance, it has been suggested to the CEO that Bazele would benefit from adopting a value-based management (VBM) approach.

The CEO requires your advice and has said, 'The shareholders are unsure what VBM is, whether it will benefit Bazele, and what changes the business would need to make if it were to adopt it. All managers in the business are already clear what their objectives are. For example, one business unit manager recently postponed some expensive staff training on improving customer satisfaction, which I believe was the correct decision. Our recent poor performance has meant we cannot afford this sort of expenditure, especially as we have no information on what levels of customer satisfaction actually are. Personally, I dislike change, but would not object to the adoption of VBM if it was thought to be beneficial for Bazele. The shareholders have heard that economic value added (EVA™) can be used to measure whether Bazele has created or destroyed value for its shareholders, but this has not yet been calculated.'

Details of the company's recent performance are given in Appendix 1.

Required:

- (a) Evaluate whether a value-based management approach is appropriate for Bazele.** (7 marks)
- (b) Explain to the CEO what changes Bazele would need to make to its performance measurement and performance management systems if it were to adopt a value-based management approach.** (7 marks)
- (c) Using the information in Appendix 1, advise the CEO whether Bazele has generated economic value for its shareholders.** (11 marks)

(25 marks)

Appendix 1 – Notes from Bazele's management accounts for the most recent year end

1. Net profit after tax for the year: \$10m
2. Capital employed at the start of the year: \$250m
3. The interest charge for the year was \$15m on a variable rate loan with an interest rate of 10%. Bazele is funded 60% by debt and 40% by equity. The cost of equity is 12%. Bazele pays tax at a rate of 20%.
4. The depreciation charge for non-current assets for the year was \$6.0m; the economic depreciation of which was \$14.0m. At the start of the period, the accumulated economic depreciation of non-current assets exceeded its accounting depreciation by \$16.0m.
5. Brought forward at the start of the year was a provision of \$4.8m which was made in respect of a debt owed by a customer who has since repaid it.
6. Within the current profit or loss account there is an expense for \$0.6m for advertising in trade magazines. This led

to several enquiries from new customers involved in large infrastructure projects, which has resulted in Bazele signing at least two large contracts after the end of the accounting period.

- 4 Laurel and Parsley (LP) is an architectural consultancy firm, specialising in the design of large commercial buildings. Due to an economic recession, which began in late 2017, demand for LP's services fell dramatically, and there was insufficient work for all of the firm's consultants. LP's chief executive officer (CEO) believes that the recession will be short and that LP should do all it can to retain its highly skilled and experienced workforce ready for when demand increases after the end of the recession. The rest of the board believe that the firm should cut the size of the workforce until that time, as LP already has an operational gearing ratio 50% higher than its main rival.

Despite the board's objections, the CEO asked for LP to prepare bids for work on non-commercial building projects, which have so far been unaffected by the recession. Though LP had little track record in designing non-commercial residential buildings, it successfully tendered a fixed fee for the design work on a large housing development. As the finance director had been absent due to illness for a year, the CEO prepared and submitted the bid himself. To meet the tight deadlines for submission of the bid, this was done at a time when most of the board were taking their annual holidays.

It quickly became apparent that the staff resources required for the housing development project were much greater than the CEO had anticipated in the bid. In the rush to submit the bid and start work, staff were not given clear milestones for completion of the project, or individual performance targets. This has led to staff working long hours, morale has fallen, and several experienced employees have since left the firm. The project is well behind schedule, and LP's client has said it will take legal action against the firm to recover any financial losses caused by the delay.

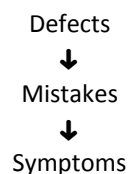
It has been suggested to the board that LP may be at risk of corporate failure, as it has score of 47 using the Argenti A Score model, which is shown in Appendix 1.

Required:

- (a) Using Argenti's A Score model, evaluate whether LP is at risk of corporate failure. (12 marks)
- (b) Advise LP what performance management systems are needed in order to improve performance in respect of each of the mistakes and symptoms you have identified in part (a). (7 marks)
- (c) Evaluate the usefulness of using qualitative models such as the Argenti A Score in predicting corporate failure. (6 marks)
- (25 marks)**

Appendix 1

Argenti A-Score model



Answers of Above Question Paper

1 To: The board of Chiven Stores (Chiven)
From: An Accountant
Date: June 2018
Subject: Performance reporting and management issues

This report evaluates the current performance report used for the annual board review and suggests three additional important performance indicators. The performance measurement aspects of the use of the value chain to help to streamline the supply chain is considered. Finally, the impact, risks and challenges of Big Data for Chiven are discussed.

(i) Performance report for annual board review

The basic role of the performance report is to allow the board to see if the mission is being achieved along with the subsidiary aims and strategically important initiatives set by the senior management.

The mission of Chiven breaks down into two parts:

- becoming the largest clothing retailer in Beeland which is measured by Chiven's market share, but without an indication of the market leader, it is not possible to see if this is achieved; and
- delivering exceptional value to its shareholders which is measured through a number of measures (dividends, EPS, economic value added and ROCE). However, it is often the growth of these indicators year-on-year which would be more useful to assess performance rather than the absolute amounts. Additionally, market average information would be important for investors so they can compare their investment in Chiven with others in their portfolios.

The subsidiary aims and initiatives based on the CEO's comments are:

- maximising opportunities from new technology
- increasing web presence
- making use of 'Big Data' in relation to Chiven's web sales
- simplifying the supply chain

There are no measures of web sales or the impact of technology on the activities of Chiven which would allow measurement of the first three aims. The basic data does not appear to be collected as sales are reported in total and not for stores and for the website separately.

The final aim does appear to be measured by looking at the number of suppliers and also the number of product lines sold (no. of suppliers x average no. of product lines per supplier). Reduction of these numbers would indicate a more streamlined supply chain. This would also indirectly improve the probability of stock obsolescence and so reduce inventory write-downs.

General comments about the current report

The current report is likely to confuse the board as it presents too many indicators and so overloads the board with information. This could be improved by reducing the number of indicators. For example, it should be considered if there is a need for both economic value added and ROCE in the report as they perform similar functions.

The report does not appear to group or appropriately prioritise the indicators presented. Suggested headings for an improved report might be:

- shareholder value performance
- market leadership
- impact of new technology
- efficiency in the supply chain

For example, the main company aim relating to shareholder value should appear at the top of the report and include dividends, EPS, economic value added and/or ROCE. As already noted, the growth of these indicators year-on-year would be more useful rather than the absolute amounts.

There is a lack of external information (especially competitor information) such as the market leading market share.

There is a lack of forward looking information which given the aim of innovation through new technology would be important. Expected growth of web sales in the market generally would allow measurement of Chiven's performance in this area.

There is a lack of a summary of property costs which could be especially useful for comparison with web operations.

There are a number of indicators which are about the detailed operation of the stores (such as average time between customer entry and employee greeting or average queueing time for customers). These are of a more operational nature and may be distracting and unnecessary in the board report, as it ought to focus on the strategic indicators.

However, the board may take the view that such customer-experience centred indicators are strategically important as they are commonly used in retail. In this case, there ought to be equivalent indicators for the web-based sales, for example, relating to number clicks or pages needed in order to make a web sale.

(ii) Three new performance measures for Chiven

There are three performance measures, which currently do not appear on the report, which would improve presentation of Chiven's results. As noted above, the current report contains many absolute figures and some ratios would simplify the work of interpreting these results.

Key issues in the current report and from the perspectives of running the physical stores are the number of employees and the floor space of the stores. Therefore, it is suggested that the revenue and operating profit per unit for each of these variables would be helpful and are also common indicators used in the retail trade.

	Total 2017	Total 2016
Revenue per employee (\$'000)	65.0	66.1
Revenue per sq metre (\$)	3,096.5	3,147.3
Operating profit (\$m)	434.3	430.0
Operating profit per sq metre (\$)	510.9	519.3

Operating profit per employee has not been calculated as the general body of employees are more concerned with sales rather than cost control and hence profits.

(iii) Streamlining the supply chain using the value chain

The value chain divides the value activities of a business into different types and then examines the links between these in order to more efficiently build value within the business.

The supply chain simplification may involve reducing the number of suppliers and making the chain more efficient. It impacts on three types of activity in the value chain: the main activity area is procurement (dealing with suppliers) but it could also include technology development (information systems) and inbound logistics. There may be other types of activity affected if these are outsourced.

The performance measures associated with this simplification are the number of suppliers and number of product lines supplied by each supplier (both areas are part of the existing reporting). They include the time taken to source new products and the revenue and profits obtained from these (new measures).

The information systems which would be involved would be those with contact to the suppliers obtaining product details and prices and also those liaising over delivery of these items. For example, these could be part of a just-in-time delivery system to reduce stock holding at Chiven.

(iv) The potential impact of Big Data for performance management at Chiven

Big Data refers to the very large amounts of data which are now available through the increased use of technology and can be used to develop predictive information about human (customer and supplier) behaviour.

There are three characteristics of Big Data: volume, velocity and variety.

The large volume of data obtained. This is best understood by considering the relevant information gathering systems for Chiven. In stores, loyalty cards being swiped at checkouts allow the details of all products purchased, the time, amount and method of payment used. On the website and on Chiven's social media pages, in addition to the data which could be collected as for stores, every page visited and every product examined or commented upon would be recorded. This information would require system hardware to store and retrieve it.

The velocity of Big Data refers to the short timescales for information developed to affect decisions. The information could be gathered in nearly real time and this might be necessary in order to react quickly to information about customers who are considering a purchase. For example, it would be much less effective to text a customer with price-comparison information after they have left the store.

The software must be present to allow the kind of data mining and predictive analysis required to perform these tasks.

Big Data is 'big' due to the variety of types of information collected. Chiven could be looking at transaction data and browsing activities, as already mentioned, but also more unusual data types such as social media reactions (text and photographs) and geographical information from customer phones.

This data is both structured and unstructured and these require different responses from the information recording and processing systems.

Risks and challenges

Systems which can record and process the volumes of data being produced are expensive, both the hardware and software. The costs are falling but as already noted, the volumes of data available are rising and Chiven's competitors will be active in this area too. It will be a process which requires large spending in order to catch up with and pass those competitors and then, constant ongoing spending to maintain an advantageous position.

The storage of personal information (e.g. about customers) is an active area of new laws and regulation. Breaking these rules can be punished both in the legal sense but also in a reputational sense resulting in lost business. In particular, theft or loss of personal data can lead to civil legal action and bad publicity.

The data obtained from qualitative sources (such as social media) can be imprecise or inaccurate and lead to inaccurate conclusions. Some data collected may be incorrect. This is sometimes referred to as the veracity problem. Also, in large volumes of data, some data may become out-of-date quickly especially about a customer's precise location and so constant monitoring of the database will be required to avoid this.

2 (a) Relevant

For the external information to be useful, it should be relevant to the needs of the users. The information in the quarterly spreadsheet contains both sales data and information on market trends in designs. All of this information may not be relevant for all of the departments to which it is circulated. For example, data on design trends may not be relevant to the production department using it to plan production capacity.

A unified database, integrating data from different sources, would make data more relevant to users by giving users only information and reports which are relevant to them and sharing data from all relevant departments. Users would not waste time interpreting data which is irrelevant to them.

Timely

For external information to be useful, it must be available when needed. This is particularly so in the fashion industry where designs change quickly and where competitors may offer short-term discounts. The external information at Luvij is only sent at the end of each quarter, which is likely to be too infrequent in the fast moving industry in which Luvij operates. Additionally, as the information is prepared by one staff member, there could be delays in producing it if they were on sick leave, for example.

A unified database would ensure that data was available instantly, especially if linked to retailers' own systems' real-time sales data. This should improve the speed of decision making.

Accurate

To be useful, information must be accurate. Entering large volumes of data into a complex spreadsheet is prone to error, as well as being time-consuming. Inaccurate data may lead to poor decision making. A unified database would process all data automatically with minimal human intervention, and would thus be less prone to inaccuracies. All departments would share identical data.

Communication

Though the spreadsheet of external information at least ensures that all departments have access to the same data, the large volume of data may be difficult to understand. Managers may be overloaded with data, much of which they do not need. A unified database would allow users access only to information which they need. This would be in an easy to use format, perhaps with the ability to drill down to more detailed information held in the database.

Emailing data to a large number of staff may mean that confidential or commercially sensitive information, such as on design trends, is shared with staff who do not require it. A unified database would restrict access to information, using passwords, only to staff who are authorised to receive it.

Cost

The cost of producing the external information should not exceed the benefits of doing so. Costs of the current system include not only the costs of employing the team to compile the information but also time spent collecting, processing or interpreting data which may be inaccurate, irrelevant or out of date.

Using a unified database would incur costs of buying, maintaining and developing the system, as well as staff training. An evaluation must be made whether these costs are justified by the benefits. Some adaptation of the existing system, such as increasing the frequency of reporting the information, or sending different sets of information to different departments, may be more cost effective.

Tutorial note: *The use of the characteristics of good information is one way this answer can be structured. There are many other approaches which would be acceptable.*

(b) Problems of performance measurement

Measuring the performance of the joint venture may require Luvij and Shirville to share confidential information, which they may be unwilling to do. Luvij's innovative designs for children's footwear and Shirville's knowledge of advanced production techniques are both likely to be commercially sensitive.

It is unclear exactly what is each of the parties' contributions to the joint venture. Luvij is providing innovative designs, and Shirville is providing advanced manufacturing machinery and production techniques. As each party is providing different things to the joint venture, it may be hard to measure the contribution, to profit for example, from each party.

Luvij and Shirville will have their own information systems. These may be incompatible, or it may be difficult or costly to integrate them. Each party may measure or collect information in a different way, which will mean information used to measure the performance of the joint venture is not prepared on a consistent basis.

Problems of performance management

Luvij's objective for the venture is to become the market leader in high-quality children's footwear. Shirville's objective is to utilise spare production capacity in a factory where the lease is due to expire in three years. As the parties have different

objectives, it may be hard to develop performance metrics for the joint venture. The share of the chosen market may be a key performance metric for Luvij, and return on capital employed may be appropriate for Shirville. The metrics chosen may conflict, and their relative importance may be unclear. This will make it difficult for managers to manage the joint venture according to each party's objectives.

Luvij's objectives for the joint venture are long term, whereas Shirville may choose to end the joint venture upon expiry of the factory lease in just three years. Establishing timescales for performance objectives may be difficult as each party has different time horizons for the venture.

Luvij is entering a new market and has already invested heavily in market research and product design. Shirville seems to have a much lower risk appetite, as it only wants to utilise spare capacity. Managing performance may be difficult because Luvij may wish to make decisions which involve a higher level of risk than Shirville may wish to accept.

The parties have may have different expectations of the level of quality of products arising from the joint venture. Luvij manufactures high-quality footwear and will want its range of children's footwear to be of a quality consistent with its women's footwear range. Shirville supplies supermarkets and high street stores, probably with lower quality products. Disagreement about acceptable levels of quality may reduce the performance of the joint venture.

- 3 (a)** In the context of VBM, value of a business is measured by discounting cash flows at the business's cost of capital. When investment returns exceed the cost of capital, value will be created for shareholders. When returns are lower than the cost of capital, value will be destroyed.

The VBM approach is to ensure that all activities and decisions in a business are undertaken so as to create value for shareholders. Currently, Bazele's overall objective is to maintain ROCE at historic levels, but this does not necessarily create value for shareholders.

This is particularly so now that Bazele has diversified into hiring large items of plant for use in major infrastructure projects. These projects last up to 10 years, so the time value of money is likely to be significant, as is the initial capital expenditure for the plant. Long-term hire agreements may give an acceptable ROCE, but may have a negative net present value, and hence destroy value for shareholders. The prediction of large increases in bank interest rates will increase Bazele's cost of capital, and further reduce the net present value of long-term agreements.

Similarly, business unit and branch managers are given the objective of maintaining net profit margins. Thus, managers may avoid activities which reduce profits in the short term, but which have future long-term benefits and create value for shareholders, such as investment in staff training.

With VBM, decisions are taken to create value for shareholders by considering value drivers, which are any factors which affect the value of the business. Value drivers may be non-financial, such as the customer satisfaction which may have been improved by the postponed staff training. A VBM approach is, therefore, suitable for Bazele as it will encourage creation of value for shareholders.

- (b)** To adopt a VBM approach, Bazele would need to use a different set of performance indicators, as ROCE and net profit margin do not necessarily create value for shareholders. Economic value added (EVA™) is a performance measure for shareholder value. Though more complex to calculate and more difficult to understand than the existing measures, EVA™ does encourage managers to make decisions, such as undertaking staff training, which have future long-term benefits. By encouraging managers to make investments which give a positive EVA™, value will be created for shareholders.

With VBM, managers would be given targets according to their areas of responsibility. For example, the board may have objectives to maximise value by making acquisitions which create value. Branch managers' objectives may be focused on non-financial value drivers such as customer satisfaction.

To identify value drivers, Bazele will need good information which is accurate, reliable and timely, for example. It is unclear whether the current management information system is able to provide good information, but the CEO has said that information on customer satisfaction is not available. Resources, such as financial investment, time and training, may be needed to improve Bazele's management information. Managers may resist the change in culture which would be required to adopt VBM; not least the CEO would need to set the 'tone at top' for what would be a disruptive and major change to Bazele. However, the benefits of adopting VBM seem to outweigh the costs of doing so.

- (c) As the economic value added (EVA™) is \$(13.1m), Bazele has destroyed value for shareholders.

Calculation of net operating profit after tax (NOPAT)

	\$m	\$m
Net profit after tax		10.0
Add: depreciation on non-current assets	6.0	
Deduct: economic depreciation	(14.0)	
		(8.0)
Add: interest (accounted for in the WACC)	15.0	
Less: tax on interest (\$15.0m x 20%)	(3.0)	
		12.0
Deduct: reduction in bad debt provision		(4.8)
Add: advertising for long-term benefit		0.6
NOPAT		9.8

Calculation of economic value of assets

	\$m
Capital employed at the start of the year	250.0
Deduct: difference in accumulated depreciation	(16.0)
Add back: increase in bad debt provision	4.8
Economic value of assets	238.8

Calculation of EVA™

	\$m
NOPAT	9.8
Deduct: capital charge (\$238.8 x 9.6%) (W1)	(22.9)
EVA™	(13.1)

W1 – Weighted average cost of capital (WACC)

Cost of equity:	12.0%
After tax cost of debt:	8.0% (10% x (1 – 20%))
WACC:	9.6% ((40% x 12%) + (60% x 8.0%))

4 (a) The extent to which the Argenti A Score indicates corporate failure in LP

The Argenti A Score assigns scores to management defects and accounting defects, which are effectively weaknesses which can lead to failure, mistakes, and symptoms. Symptoms are indications that the business is actually failing. The resulting score indicates whether or not LP is or is not at risk of corporate failure. Between these two extremes, there is a grey area where further analysis is required to reach a conclusion. An A Score of 25 or above indicates a high risk of corporate failure. As LP's A Score is 47, it is at high risk of failure.

Defects

The chief executive appears to be an autocrat, which is a management defect under the Argenti A Score model. LP prepared bids for work in areas it had little track record in, which was the strategy preferred by the chief executive, even though the rest of the board wanted to reduce the workforce to reduce operating gearing after the start of the recession. This suggests that the chief executive has a dominant influence over the rest of the board and that the board of directors is passive, which is another management defect.

The submission of the bid was done when most of the board members were on holiday, so in this respect too, the board was passive as it had no opportunity to discuss or review the bid. Similarly, the bid was made when the finance director was on long-term absence. An ineffective finance director is a management defect which increases the risk of corporate failure.

The fact that the amount of staff resources, and therefore cost, required to perform the work on the housing development was greater than anticipated was an accounting defect which increases the risk of failure.

Mistakes

LP undertook a large project in an area where it has little experience, and at a fixed fee. This was a high-risk venture, particularly as LP failed to set clear milestones for the project or put in place adequate performance management systems. This is a management mistake which, in the absence of suitable insurance cover, may mean LP is unable to meet any legal claims brought against it.

LP has an operational gearing ratio which is 50% higher than its nearest rival. Failing to address this high level of fixed cost, for example, by reducing the workforce for the duration of the recession, is also a management mistake which increases the risk of corporate failure.

Symptoms

Any symptoms of impending problems would indicate a high risk of corporate failure, even if LP's A Score were to be below the maximum acceptable score of 25. The low staff morale, and staff leaving the firm due to working long hours with unclear individual performance targets, is a symptom that the firm is at risk of failure.

(b) Mistakes

The failure of the big project for the design work for the housing development, and the high operational gearing, are management mistakes which increase the risk of corporate failure. To improve performance in these areas, LP needs effective performance management systems.

(1) Failure of the big project for the design work for the housing development

LP should identify critical success factors (CSFs) for improvement in performance. Big projects, especially those which are outside LP's usual activities should be fully scrutinised by the board, and the risks of the project thoroughly assessed. This would help prevent LP taking on projects for a fixed fee, where the costs of performing the work are poorly understood. The use of realistic budgets and clear project milestones would have helped identify that the major project was failing and allowed corrective action to be taken. Clear budgets and project milestones should be key performance measures to identify failure of the major project.

(2) Operational gearing

From the CSFs LP must develop key performance indicators (KPIs). The operating gearing is an obvious KPI to help reduce the firm's high operating gearing. Cash forecasts would also help to identify and correct high operating gearing. Performance targets such as these should be clearly communicated and linked to employee rewards.

Symptoms

Clear milestones and performance targets were not set for the housing development project and the project has fallen behind schedule. This has led to low staff morale and to staff leaving the firm. All of these are symptoms of corporate failure.

Performance against the targets should be regularly monitored, for example, by using staff appraisals and surveys to monitor staff satisfaction. This could indicate where additional training or support is required.

Measuring staff turnover would help measure this symptom of corporate failure so that LP could try to identify why staff were leaving.

(c) Advantages of using qualitative models in predicting corporate failure

The subjectivity of the A Score can be an advantage over quantitative indicators of corporate failure, as it allows the person calculating the A Score to use their own professional judgement in considering individual circumstances.

It also recognises factors which have been observed in failing companies and which often can be seen in organisations before they reach a terminal state.

The A Score model incorporates financial (such as the operating gearing ratio), and non-financial factors, which give a more holistic assessment of whether failure is likely than just looking at financial or non-financial factors alone.

Disadvantages of using qualitative models in predicting corporate failure

Calculating the A Score is subjective and requires experience and professional judgement, for example, in determining whether LP's board is passive. In reality, passive will be on a scale rather than just passive or not, which also makes it difficult to compare the score between organisations.

The A Score focuses on internal factors, which limits its usefulness. The economic recession has had a serious impact on LP, which calculating the A Score alone would not consider. Further analysis of the external environment, such as using a PEST analysis, or calculation of competitors' A Scores, would consider external factors in determining whether LP is at risk of corporate failure.

A limitation of the A Score model is that it is only a snapshot at a particular time and does not indicate when corporate failure may occur. Defects and management mistakes may take a long time before they lead to corporate failure. In LP, corporate failure may occur if it is subject to legal action for the delay of the housing project. Conversely, the recession may end and LP may no longer be at risk.

The fact that the A Score does not give a definitive indication of whether failure will happen may mean inappropriate decisions are taken as a result of the analysis. It must be considered whether the time and cost in calculating the score are justified by the benefit of doing so. The results of the A Score may be inconclusive and indicate that the subject is in the 'grey area'. This will require yet further analysis before a conclusion can be reached. This does not appear to apply to LP which is currently clearly at risk of corporate failure using the A Score model.

Strategic Professional – Options

Advanced Performance Management (APM)

Wednesday 5 December 2018



Time allowed: 3 hours 15 minutes

This question paper is divided into two sections:

Section A - This ONE question is compulsory and **MUST** be attempted

Section B - BOTH questions are compulsory and **MUST** be attempted

Present Value and Annuity Tables are on pages 10 and 11.

Do NOT open this question paper until instructed by the supervisor.

This question paper must not be removed from the examination hall.

APM

Think Ahead

ACCA

The Association of
Chartered Certified
Accountants

Section A – This ONE question is compulsory and MUST be attempted

1 Rezillos: Company information

Rezillos Engineering (Rezillos) is a listed company, manufacturing pumps and valves for use in the chemical industries. These highly engineered components must be integrated into Rezillos' customers' own plant and equipment. The company has grown significantly via acquisition in the last 20 years to become a worldwide business.

The overall objective of the company is 'to deliver sustainable growth in value to the shareholders by working in partnership with customers to deliver innovative and value-for-money solutions utilising the skills of the highly-trained workforce.'

The chief executive officer (CEO) has recognised that the company has been so focused on making acquisitions that it has not improved other aspects of management. He has asked you to produce a report for the board of Rezillos to cover a number of areas.

Performance reporting system

The CEO would like an evaluation of the performance reporting system used at the strategic board level by Rezillos. The current performance report used for the annual review at board meetings is given as an example (Appendix 1).

Customer survey

At the most recent round of meetings with stock market analysts, the board has been criticised about a customer survey whose results were announced at these meetings. The criticisms centred on the method of calculation, sampling and the disclosures in the press release. The board of Rezillos is concerned by the impact of this on their reputation in the market and needs to understand whether the criticism is justified. The press release and some further internal details about the method and the results of the customer survey are given in Appendix 2.

Benchmarking proposal

Rezillos has three divisions based in its three countries of operation (Beeland, Teeland and Veeland). In order to drive forward the integration of the divisions, the CEO has decided that they should be benchmarked against each other. He is aware that this is not the only method of benchmarking and so, initially, wants you to provide an understanding of the different types of benchmarking and an evaluation of the usefulness of the proposed type of benchmarking for the divisions. Finally, he has supplied data in Appendix 3 to allow you to complete the benchmarking exercise and comment on the metrics used and the results.

It is now 1 December 20X8.

Required:

Write a report to the board of Rezillos to:

- (a) Evaluate the performance reporting system as requested. (13 marks)
- (b) Assess the analysts' criticisms of the customer survey results in Appendix 2. (9 marks)
- (c) Respond to the CEO's request for work on:
 - (i) the method of divisional benchmarking proposed; and (9 marks)
 - (ii) benchmarking the three divisions. (15 marks)

Professional marks will be awarded for the format, style and structure of the discussion of your answer. (4 marks)

(50 marks)

Appendix 1

Rezillos

Rezillos	Year to 30 September				Total	Growth	Profit as a % of revenue		
	Beeland	Teeland	Veeland	Total			Company	Industry average	
	20X8	20X8	20X8	20X8			20X7		
	\$m	\$m	\$m	\$m			\$m		
Revenue	738	2,030	923	3,691	3,504	5·34%			
Cost of sales	497	1,391	601	2,489	2,363				
Gross profit	241	639	322	1,202	1,141		32·6%	29·8%	
Other operating costs									
Selling and distribution costs	89	208	101	398	380				
Administration costs (note 1)	74	171	83	328	321				
Total	163	379	184	726	701				
Operating profit	78	260	138	476	440	8·18%	12·9%	9·7%	
Finance costs				88	88				
Group profit before tax				388	352		10·5%		
Tax				78	71				
Group profit after tax				310	281		8·4%		
Return on capital employed (ROCE)				8·64%					

Note

- 1 Administration costs contain an allocation of product development costs to each division.

Appendix 2

Press release from Rezillos: Customer survey results

Rezillos has performed an extensive survey of its customer base and is proud to announce an average customer rating of 7.0 (out of 10). This bears positive comparison with a leading competitor of Rezillos who performed a survey last year scoring an average rating of 6.0.

The survey asked for a customer rating on a scale of 0 to 10, where 10 was exceptional, 5 was good and 0 was unacceptable.

End of press release

Extract from Rezillos internal document on calculation of customer rating

The survey was carried out by the staff at head office who sampled customers from all three divisions.

Raw data

Customer number	Rating	Account size (\$m)	Division
1	10	1.5	Beeland
2	9	3.3	Beeland
3	9	2.1	Beeland
4	6	6.4	Beeland
5	6	152.0	Teeland
6	6	11.2	Beeland
7	6	10.5	Beeland
8	6	74.0	Veeland
9	5	21.0	Veeland

Other notes:

- 1 The company has 180 customers in total.
- 2 The customer number is an identification number for administrative purposes.
- 3 Each division has its own marketing and customer support function although product development is a head office function.

Appendix 3 (all data is for 20X8 unless otherwise stated)

The benchmarking exercise is partly complete with the metrics requiring to be calculated identified by question marks.

	Beeland	Teeland	Veeland
Benchmarking metrics			
Growth of market	8.5%	3.2%	5.0%
Revenue growth	12.5%	3.2%	4.8%
Operating margin	10.6%	12.8%	15.0%
Inventory days	162	162	?
Order book growth	5.2%	5.3%	?
Number of face-to-face interactions with division's top 10 key customers	260	120	40
Percentage of revenue from new products introduced in the last three years	24.9%	29.0%	?
Reduction in incident rate	3.4%	0.0%	?
Utilisation of learning and development programme	1.20	1.26	?

Notes

- 1 The industry standard method of calculating incident rate is:
Incident rate = number of incidents per year x 200,000/number of employee labour hours paid
- 2 The company's employees work on average 40 hours per week for 50 weeks per year.
- 3 Utilisation of learning and development programme is measured by the number of training days per employee.
- 4 Key customers are designated by the divisional management.
- 5 A single inventory management system has been implemented across the whole company.

The following data has been collected to assist in the completion of the benchmarking exercise:

	Veeland
Revenue from new products introduced in the last three years (\$m)	163
Cost of sales (\$m)	601
Inventory (\$m)	267
Number of incidents (20X8)	68
Number of incidents (20X7)	74
Number of employees (20X8)	6,600
Number of employees (20X7)	6,250
Order book (\$m) 20X8	932
Order book (\$m) 20X7	885
Number of training days	6,450

Section B – BOTH questions are compulsory and MUST be attempted

2 Zones: Company information

Zones is an overnight parcel delivery business. Since it was founded by the current CEO, it has grown rapidly due to a boom in online shopping. It now operates 1,000 delivery vehicles of various sizes. Recently, financial performance and market share have deteriorated. Zones has had no clear corporate vision, an excessive focus on financial objectives and inadequate systems to measure and manage performance of the underlying processes driving its financial performance.

Business model

Zones' collection and delivery service uses delivery vehicles to transport parcels to and from local depots and individual addresses. Vehicles may also pick up parcels from the addresses to which they deliver. Each time the vehicle calls to pick up or deliver parcels is known as a stop, and the time of day for each stop is booked in advance. At the end of each day, vehicles, along with any parcels not delivered, return to the depot. Regardless of who pays for the service, Zones regards anyone to whom it delivers, or from whom it picks up parcels, as a customer. In the long term, the requirements of both of these groups for a competitively priced, reliable and flexible service will be similar.

Performance improvement proposals

The CEO believes that reductions in customer satisfaction and flexibility, caused by a decline in operational performance, may have led to the recent deterioration in financial performance and market share. It has been suggested that Zones use the Lynch and Cross performance pyramid (Appendix 1) to reverse this deterioration, and three new measures for operational performance have been suggested in Appendix 2. The CEO has stated that Zones' corporate vision should be:

'To increase shareholder wealth by becoming the leading overnight parcel delivery business, providing quality, reliability and value for customers.'

It is also proposed to use the DMAIC (define, measure, analyse, improve and control) method to implement the six sigma methodology to improve the quality of delivery. Two measures have been defined in Appendix 3 which may help improve Zones' delivery performance.

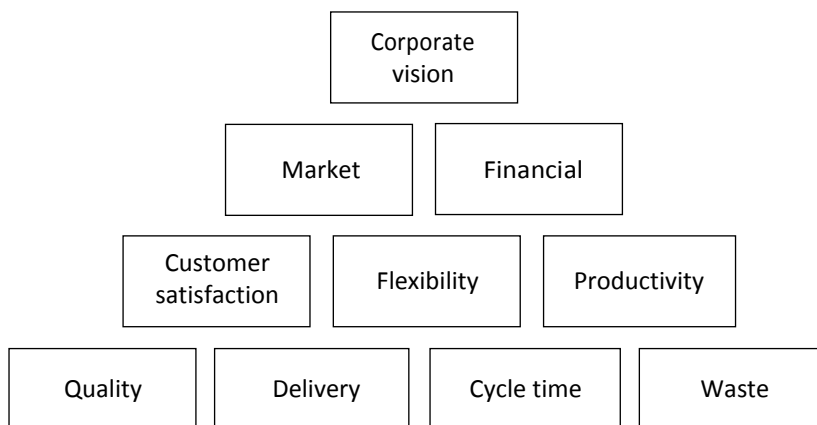
Required:

- (a) Advise the CEO how the Lynch and Cross performance pyramid can help Zones achieve its corporate vision. (7 marks)
- (b) Using the performance pyramid, evaluate the extent to which the suggested new measures in Appendix 2 can be used to measure and manage operational performance at Zones. (9 marks)
- (c) Advise whether the two measures defined in Appendix 3 are suitable for use in the DMAIC method to implement the six sigma methodology in order to improve delivery performance. (9 marks)

(25 marks)

Appendix 1

Lynch and Cross performance pyramid



Appendix 2

Suggested new measures for operational performance

Measure	Description
Vehicle utilisation	Average utilisation of all vehicle capacity. This is measured by taking the average of vehicle load as a percentage of capacity when the vehicle leaves the depot at the beginning of each day and the vehicle load as a percentage of capacity when the vehicle returns to the

	depot at the end of each day. Capacity is measured either according to the internal volume or the length of the vehicle, depending on the type of vehicle being used.
Fuel consumption	Average litres of fuel per kilometre travelled for all vehicles.
On-time stops	Percentage of stops made within 30 minutes* of the booked time.

* Zones receives complaints from customers relating to deliveries not made on time. Of these, less than 0.0001% relate to deliveries made within 30 minutes of the booked time.

Appendix 3

Suggested new measures for improving quality of delivery using the DMAIC methodology

Measure	Description
On-time stops	Percentage of stops made within 10 minutes of the booked time.
Failed deliveries	Percentage of deliveries which cannot be made due to the customer being unavailable to take the delivery, or by parcels being incorrectly addressed. Currently, 5% of deliveries are failed and have to be returned to the depot.

3 Sberry: Company information

Sberry manufactures products which have a short lifecycle due to technological obsolescence. It aims to keep each product in production for at least 18 months so that it can recover the high cost of product development and make an acceptable profit before the product becomes obsolete. Sberry has always manufactured its products in its home country of Deeland, from where all materials are also sourced.

Sales opportunity in Kayland

An opportunity has been identified to export one of three newly developed products, Red, Blue and Green, to Kayland, due to citizens' increasing levels of income there. The rate of technological obsolescence is slower in Kayland than in Deeland. The estimated levels of demand, selling prices and costs of the three products are shown in Appendix 1.

Stakeholders' views on the risks of the Kayland opportunity

Three of Sberry's key stakeholder groups, employees, directors and shareholders, have been consulted for their views on the proposal to export to Kayland and, in particular, on which of the three newly developed products to export there.

The employees have a cautious approach to the proposal following the recent failure of another product launch. That product was withdrawn as it breached poorly understood safety regulations and a number of employees lost their jobs as a result.

The directors, all of whom are individually wealthy, have served on the board for many years and are keen to earn the large bonus which is currently offered solely on the total profit made by the new product over its lifecycle.

The shareholders neither avoid nor seek risk, but they are keen that the company considers the external environment in Kayland in order to maximise performance there, whichever of the products is chosen to be exported. They have asked for a PEST* analysis of the environment in Kayland to be produced. A first draft of this has indicated that the exchange rate between the Deeland dollar (D\$) and the Kayland dollar (K\$) is a key economic factor which may affect performance.

*Political, economic, socio-cultural and technological

Required:

- Advise which of the three newly developed products each of the three key stakeholder groups would choose to export to Kayland based on their respective risk appetites. (14 marks)
- Explain the problems of using the risk and uncertainty analysis techniques which you have used in part (a). (5 marks)
- Advise the shareholders how analysing the external environment in Kayland using a PEST analysis can help Sberry maximise its performance there. You are NOT required to produce a PEST analysis. (6 marks)

(25 marks)

Appendix 1

Estimated levels of demand, selling prices and costs of the three newly developed¹ products

	Red	Blue	Green
Total demand (units) ²	50,000	60,000	160,000
Selling price (K\$) ³	8.00	9.00	6.00
Total unit cost (D\$) ⁴	2.40	3.00	2.50

Notes to the appendix

¹ Development costs are sunk costs and can be ignored.

² The estimated product life of each of the three products is the same and the total demand is for the whole life of the product.

³ The current exchange rate between the D\$ and the K\$ is D\$1.00 = K\$2.00. Sberry's finance director has estimated that over the life of the product there is a 75% probability that the average exchange rate of the D\$ will strengthen by 10% against the K\$, and a 25% probability that the average exchange rate of the D\$ will weaken by 10% against the K\$.

⁴ At the current exchange rate, 50% of the total costs for each product is for materials which are imported from Kayland and invoiced in K\$. There will be no opening or closing inventory, whichever of the three new products is chosen.

Answers of Above Question Paper

Strategic Professional – Options, Paper APM
Advanced Performance Management

December 2018 Answers

1 To: The board of Rezillos Engineering (Rezillos)

From: An Accountant

Date: December 20X8

Subject: Performance reporting and benchmarking at Rezillos

This report evaluates the current performance report used for the annual board review. Next, the customer rating survey method and reporting are examined. Finally, the method of benchmarking to be used for the divisions is evaluated and the divisional benchmarking exercise is completed and initial conclusions drawn.

(a) Performance report for annual board review

The current report has a number of strengths and weaknesses. These will be discussed according to whether the report:

- measures performance towards the overall aims of the company; and
- is well-presented.

The current mission of the group can be broken down into a number of parts:

- The overall objective of the company is to deliver sustainable growth in value to the shareholders.

This is to be done by:

- working in partnership with customers;
- to deliver solutions which are
 - o innovative; and
 - o value-for-money;
- utilising the skills of the highly-trained workforce.

Beginning with the overall objective of Rezillos, the report does not directly measure shareholder value and so does not report its growth which are the primary goals of the organisation. This could be done directly by economic value added (EVA™) or total return to shareholders. Also, the report is wholly historical and contains no information about the future prospects necessary to judge whether the growth in shareholder value is sustainable. The current report uses period profits and return on capital employed as its main measures of performance. These can suffer from being short term unlike economic value added.

Overall, the report does not give information about the performance of the strategies which are in place to deliver the overall objective. These will require non-financial measures and so do not appear in the report which is dominated by standard accounting information.

There is no measure in the report of how the company works with customers. The company does collect data on interaction with customers at a divisional level although measuring 'working in partnership' is a vague term which should be more accurately defined in order to be measured, possibly by measuring the number of joint product development projects undertaken.

An indirect measure of the customer value-for-money is being offered through the gross profit which, when compared to the industry average, gives a partial measure of value but without data on the price/quality mix compared to competitors, it is difficult to be conclusive about this. Revenue growth is given but should be compared to industry growth in order to give an impression of the attractiveness of our offering to the customer.

No measure of innovation is offered in the report either in terms of the number of new products or the revenue or profit generated from them. This appears to be an important fault as an engineering firm such as Rezillos will only be viable in the long term if it continues to innovate.

There is no information on the skills or training done with Rezillos' workforce and given the emphasis on innovation and the sector in which Rezillos operates, these appear to be important factors.

There are measures appropriate for these strategies available within the divisions (see the benchmarking exercise later). These could provide easy solutions to many of these gaps.

The report treats the divisions in the same way as the group, using profit and comparison to industry average margins and budgets as the main assessment tools. This may not be helpful as the divisions are in different markets and so may not be easily comparable. This problem could be solved by providing the targets set for each of the divisions for the major financial indicators.

It is unusual, given the preponderance of financial data in the report, that there is very little about the assets and liabilities of the company or its liquidity. This may be acceptable if the efficiency of capital use and the danger of insolvency are negligible but this appears unlikely as shareholder value is a key measure and the ROCE is narrow.

In terms of presentation, the data are clear and in a form which would be easily recognisable to those used to reading accounts. However, it is common to provide a narrative commentary with such a report in order to highlight the key features in the report such as major deviations from target or performance well outside industry norms.

(b) Customer survey ratings

In a recent analysts' meeting, Rezillos has been questioned about its disclosure that it has an average 7.0 customer rating. The average customer rating is correctly calculated as 7.0 from the sample data. However, there are a number of questions which could be raised over the method of calculation and sampling.

The first issue which might be raised is what does 'average' mean in this context. The method used for the calculation is the arithmetic mean but average can also be considered to be the mode (most common rating) or the median (the middle value of the sample, which here would be the 5th value). Both of these alternative methods of calculation would give the lower value of 6.0 for the rating.

The calculation method does not take into consideration the size of the account. The rating of the large accounts might be considered more important and so given some extra weighting in the calculation.

A larger area of concern would surround the sample selected for the calculation. There are a number of questions to be raised about this:

- 1 A confidence interval and level should be supplied for the rating. If the sample is a small one or the confidence level required is high, then the confidence interval might be shown to be unacceptably large.
- 2 The method of sampling is not disclosed. Ideally, it should be a random sample.
- 3 There are various ways in which the sample might be biased:
 - (a) Only customers who are expected to give a favourable response may have been selected.
 - (b) It could be that only the customers who chose to respond are included in which case the sample will often be populated with those at the extremes of opinion on Rezillos' service.
 - (c) The majority of customers in the sample are from Beeland (six of nine) and only one from Teeland. This will not allow the rating to identify divisional performance, which, given each division has responsibility for customer support, may create a bias. In order to do this, random samples from each division should be taken separately.
 - (d) There are only three customers sampled with an above average account size (\$20.5m). It is common in such surveys to ensure that all of the major accounts are sampled.

Overall, the criticism appears justified and in future, Rezillos should consider disclosing more detail of the method of sampling and the sample size in order to build trust with the investing community.

(c) (i) Methods of benchmarking

There are broadly three methods of benchmarking relevant here. The proposed benchmarking exercise is an internal one

comparing divisions within the same organisation.

The other methods are external (or competitor) benchmarking where comparison is drawn with competitors. This is valuable in identifying areas where the other companies demonstrate competitive advantage and also areas for improvement with a similar business. However, although this method can suggest areas where Rezillos can catch up with its major competitors, it will not identify how to gain advantage over these rivals.

At a practical level, the difficulty with this method is obtaining the information and even if a competitor can be persuaded to share information, it will often only give strategic improvements, not operational ones, as such detailed information is unlikely to be in the public domain.

A third method of benchmarking is functional benchmarking with a world-class company from another business sector. Rezillos could share detailed operational data without the worry of loss of confidential information directly to a competitor. The difficulty lies in translating lessons learned from one industry to another, so it is often done for generic activities such as logistics. Functional benchmarking against a company from outside Rezillos' industry sector could be challenging as it will require the use of information from another company which will likely use different systems to collect data.

The major advantage of internal benchmarking is the ability to obtain detailed operational information and so to share best practice amongst the divisions. This will show the different divisions the advantage of being part of a larger company and assist in integrating them.

This method of benchmarking suffers the drawback that it will often involve non-financial data whose production is often less robust than the financial systems involving subjective judgements. Also, it will not necessarily identify world-beating performance. Its internal focus may lead the company to ignore competitor performance. However, as a one-off exercise to harmonise and improve the divisions' performance, it seems to be suitable for Rezillos now.

(ii) Divisional benchmarking exercise

The benchmarking has been completed as follows:

	Beeland	Teeland	Veeland
Benchmarking metrics			
Growth of market	8.5%	3.2%	5.0%
Revenue growth	12.5%	3.2%	4.8%
Operating margin	10.6%	12.8%	15.0%
Inventory days	162	162	162
Order book growth	5.2%	5.3%	5.3%
Number of face-to-face interactions with top 10 customers	260	120	40
Percentage of revenue from new products introduced in the last three years	24.9%	29.0%	17.7%
Incident rate (20X8)	1.14	1.13	1.03
Incident rate (20X7)	1.18	1.13	1.18
Reduction in incident rate	3.4%	0.0%	12.7%
Utilisation of learning and development programme	1.20	1.26	0.98

The benchmarking metrics appropriately reflect many of the detailed strategies of the company:

- Order book growth reflects the sustainability of current levels of business;
- Number of face-to-face interactions with top 10 customers reflects working in partnership with customers;
- Innovative solutions is measured by percentage of revenue from new products introduced in the last three years; and
- Caring for employees and nurturing their skills is measured by reduction in incident rate and utilisation of learning and development programme.

The major missing piece is the change in shareholder value or profit generated by each division.

The initial three metrics identify the broad financial performance of each division:

- Beeland is operating in a high growth market and seems to be using lower prices and a sales drive (visiting top customers more regularly) in order to push growth above the market rate.
- Teeland operates in a more stable market but one where the take-up of new products is higher.
- Veeland is growing more slowly than its market possibly due to higher margins and a weak sales effort.

So, the divisions apparently operate in different markets but there does appear to be scope to share practices between them in order to improve. Looking at the individual metrics in more detail:

- Inventory days is the same across the divisions reflecting the new company-wide inventory management system. This indicates that some aspects of integration are working.
- Order book growth is an important measure of the future growth and sustainability of current profits in the business. All three divisions are performing comparably. Beeland, however, with its effort to see customers every two weeks on average is seeing higher levels of revenue growth and the other divisions might learn from this.

- Teeland is seeing the highest proportion of sales of new products but this may reflect the fact that they operate in a more developed market. This could only be controlled by obtaining external data such as industry averages for each country.
- Veeland has shown a significant reduction in safety incidents and its training and operating procedures should be shared with the other divisions in order to see if similar improvement can be replicated there.
- Not surprisingly, the market with the largest proportion of revenue from new products is also the one which makes greatest use of training. The low training score in Veeland may reflect little sales training as the number of sales interactions shows the most dramatic difference of all the metrics.

- 2 (a) The performance pyramid covers not only financial performance but also performance relating to a wide range of underlying processes which drive financial performance. As such, it helps to set financial and non-financial performance measures, such as on-time stops. Non-financial measures are leading indicators which can help to achieve long-term future financial performance. This would be useful to Zones, which has had excessive focus on financial objectives and inadequate systems to measure and manage performance of the underlying processes driving financial performance. It is unclear exactly what the current financial objectives are.

The elements of the pyramid are interrelated, and each level in the pyramid supports the one above it. For example, on-time stops will increase customer satisfaction, which will eventually lead to greater market share, one element of the corporate vision.

Objectives cascade down the pyramid from the strategic to the operational level. The vision to increase shareholder wealth can be supported by financial objectives such as EVA™ at the level below. Measures flow up the pyramid, so that measurement of on-time stops can help determine whether Zones is achieving customer satisfaction.

The pyramid ensures that all aspects, both internal and external, of performance are measured. The right hand side of the pyramid covers internal efficiency, such as flexibility and productivity, while the left hand side covers external effectiveness, such as customer satisfaction. Using on-time stops again as an example, which relates to the quality (external effectiveness) element of the pyramid, will lead to improved performance up the left hand side of the pyramid.

- (b) Operational performance is represented by the four elements at the bottom level of the performance pyramid, which are quality, delivery, cycle time and waste. It is unclear what quality means in the context of the corporate vision, though the measure of on-time stops could be interpreted as a measure of quality, which is valued by customers. There is no direct measure of cycle time, for example, the time taken between collecting a parcel and delivering it. Also, there is no direct measure for delivery, which in this context would be the amount of time needed to arrange a collection or delivery.

Vehicle utilisation

This is a good way to measure waste. The greater the utilisation of vehicle capacity, the lower the waste, for example, of vehicle running costs. In the long run, higher vehicle utilisation would mean the number of vehicles operated could be reduced for the same level of activity. This would lead to increased productivity and financial performance, so helping to achieve the corporate vision.

Vehicle utilisation will vary, according to location, time of year and type of vehicle used, and is also measured inconsistently, according to the type of vehicle. Vehicle utilisation may be too broad a measure, making it difficult to manage performance. Areas of poor performance may mask other areas of good performance. Similarly, measuring utilisation as an average between that at the beginning and end of each day may not actually represent the average utilisation during the day.

Fuel consumption

Reducing fuel consumption would lead to a significant increase in financial performance at Zones. Measuring average fuel consumption per kilometre travelled does not, however, relate directly to activity, for example, to the number of parcels delivered.

Average fuel consumption will vary between type of vehicle and between rural and urban areas. A large vehicle may have high fuel consumption per kilometre travelled, but will also carry a large number of parcels. Average fuel consumption per kilometre is not a good measure of waste, or any other aspect of operational performance. To be useful in managing operational performance, this measure should be changed to average fuel consumed per parcel delivered. In this case, this would be a suitable measure for waste.

On-time stops

Customers are likely to value on-time stops very highly, and along with value for money, this will be one of the main reasons they will choose to use Zones. This is reflected in the corporate vision. The proportion of on-time stops is a measure of operational performance which relates to the quality element of the performance pyramid and is a key driver of customer satisfaction.

Tutor note: *Answers structured on the basis of the four operational elements of the pyramid would be acceptable.*

- (c) The DMAIC acronym stands for define, measure, analyse, improve and control. These are the five phases by which the

six sigma methodology is implemented. To be suitable for use in the DMAIC method, measures defined must have certain characteristics.

Percentage of stops made within 10 minutes of the booked time

According to the six sigma method, only those measures which are valued by the customer should be measured. On-time stops will be valued by customers, and contribute to customer satisfaction.

Currently, however, of all complaints which Zones receives from customers relating to stops not made on time, less than around 1 per million of these relate to those made within 30 minutes of the booked time. This level of complaints is so low that this would already achieve the very low number, 3·4 per million, of failures targeted by implementation of the six sigma methodology.

It seems that customers will not value stops made within 10 minutes of the booked time, any more than they would value those within 30 minutes. Another principle of six sigma methodology is not to measure what customers are already satisfied with. They are already satisfied with stops made within 30 minutes of the booked time.

The percentage of stops made within 10 minutes of the booked time is not a suitable measure. The time and costs of making the measurements will exceed the benefits of doing so.

Failed deliveries

Failed deliveries will represent a considerable cost to Zones in terms of wasted fuel and driver time. It may also reduce flexibility by using up vehicle capacity which could be used to carry more parcels. Even though deliveries may fail due to traffic congestion, they will still reduce customer satisfaction.

The percentage of failed deliveries is currently 5%, well above the target rate for failures under the six sigma methodology (which is better than 3·4 per million accuracy), and in this respect would be a suitable measure.

According to the six sigma method, only those measures which can be improved should be measured. Failed deliveries arising from customers being unavailable to take the delivery is completely out of Zones' control. Deliveries failing due to incorrectly

addressed parcels could be reduced to some extent, for example, by the use of information technology to check the correct address, but most failures due to this are outside Zones' control. As failed deliveries cannot be significantly improved, this is not a suitable measure.

3 (a) Employees

Employees are cautious about the proposal to export to Kayland, and are risk averse. They would use the maximin rule, which is the choice of product with the best of the lowest outcomes. In this case, this is Blue.

Directors

Directors are paid a high bonus dependent on profitability of the product chosen. As they have served on the board for many years, there appears to be little chance that they would be removed by making a poor choice. They are risk seekers, and will use the maximax rule, that is, the choice of product with the best possible outcome. In this case, this is Green.

Shareholders

Shareholders are risk neutral. They will choose the product with the highest expected value; in this case this is also Blue, which has an expected value of D\$82,728.

Total profit

Probability	Exchange rate (W1)	Red (D\$)	Blue (D\$)	Green (D\$)
0·75	2·20	67,273 (W2)	73,637	54,546
0·25	1·80	95,555 (W3)	110,000	111,111
Expected value (W4)		74,344	82,728	68,688

Workings

W1 – Exchange rate

\$D strengthens by 10% against \$K: $2·00 + 10\% = 2·20$

\$D weakens by 10% against \$K: $2·00 - 10\% = 1·80$

W2 – Total profit at exchange rate of \$D1·00 = \$K2·20

	Red (D\$)	Blue (D\$)	Green (D\$)
Revenue in K\$	400,000	540,000	960,000
	(50,000 x K\$8·00)	(60,000 x K\$9·00)	(160,000 x K\$6·00)
Revenue in D\$	181,818	245,455	436,364
	(400,000/2·20)	(540,000/2·20)	(960,000/2·20)

Cost of imported materials (D\$)

Red (50,000 x 1.20 x 2.00/2.20)	54,545		
Blue (60,000 x 1.50 x 2.00/2.20)		81,818	
Green (160,000 x 1.25 x 2.00/2.20)			181,818
Cost of other materials (D\$)	60,000	90,000	200,000
	(50,000 x D\$1.20)	(60,000 x D\$1.50)	(160,000 x D\$1.25)

Total profit (D\$)

Red (181,818 – 54,545 – 60,000)	67,273		
Blue (245,455 – 81,818 – 90,000)		73,637	
Green (436,364 – 181,818 – 200,000)			54,546

W3 – Total profit at exchange rate of \$D1.00 = \$K1.80

	Red (D\$)	Blue (D\$)	Green (D\$)
Revenue in K\$ (W2)	400,000	540,000	960,000
Revenue in D\$	222,222	300,000	533,333
	(400,000/1.80)	(540,000/1.80)	(960,000/1.80)
Cost of imported materials (D\$)			
Red (50,000 x 1.20 x 2.00/1.80)	66,667		
Blue (60,000 x 1.50 x 2.00/1.80)		100,000	
Green (160,000 x 1.25 x 2.00/1.80)			222,222
Cost of other materials (D\$) (W2)	60,000	90,000	200,000
Total profit (D\$)			
Red (222,222 – 66,667 – 60,000)	95,555		
Blue (300,000 – 100,000 – 90,000)		110,000	
Green (533,333 – 222,222 – 200,000)			111,111

W4 – Expected value

	Red (D\$)	Blue (D\$)	Green (D\$)
Red (0.75 x 67,273) + (0.25 x 95,555)	74,344		
	(50,455 + 23,889)		
Blue (0.75 x 73,637) + (0.25 x 110,000)		82,728	
		(55,228 + 27,500)	
Green (0.75 x 54,546) + (0.25 x 111,111)			68,688
			(40,910 + 27,778)

- (b) Sberry's three key stakeholder groups will use different criteria to make decisions on the Kayland opportunity according to their attitude to risk and reward. The maximin and maximax rules and the expected value can be used to determine the decisions which each group will make.

Maximin and maximax rules

The maximin rule, the choice with the best of the lowest outcomes, which would be preferred by the employees, can be an excessively risk averse approach. As Sberry's products have short product lives, it must constantly develop new products, so some commercial risks will have to be taken.

The maximax rule, which the risk-seeking directors prefer, has the problem that it may be overly optimistic. Product choices with the maximum reward or profits may also be riskier, and could mean that directors take risks which exceed the shareholders' risk appetite so as to earn high bonuses.

A problem with both of the maximin and maximax rules is that they both ignore the probability of the outcome actually occurring.

Expected value

The expected value approach is a long run average which can be applied to decisions which are repeated many times. The actual expected value is not a possible outcome and will never occur in practice. Though Sberry may have developed many products, it has no experience of forecasting exchange rates and so the expected value approach may be inappropriate.

The expected value approach relies on estimates of probabilities, such as for average exchange rates. These may be subjective or difficult to make, which limits the value of this approach.

- (c) **Identifies opportunities or threats**

Analysing the external environment in Kayland will allow Sberry to identify opportunities and threats. It can maximise performance by taking actions to exploit opportunities, such as developing the new products to take advantage of growing income levels and the slower rate of technological obsolescence in Kayland.

A draft PEST analysis has indicated that the exchange rate between D\$ and K\$ is a key economic factor affecting performance. By identifying this, Sberry can act to maximise performance, such as by analysing the effect of exchange rates on profits of the new products or hedging against adverse exchange rate movements. A thorough analysis of safety regulations in Kayland may prevent the problems which occurred with the failure of the previous product launch.

Identifies CSFs, KPIs and helps set targets

PEST analysis can help identify critical success factors (CSFs) and key performance indicators (KPIs). Having identified product safety as a legal factor affecting performance, a CSF may be to abide by safety regulations in Kayland. The number of breaches of safety regulations would be a suitable KPI.

The PEST analysis can be used to set targets appropriate for the environment in Kayland. A CSF for Sberry is that it produces products for long enough to recover their development costs and make an acceptable profit. A target for the KPI of length of time in production could be 24 months in Kayland, where technical obsolescence is slower, rather than the target of 18 months in Deeland.

Strategic Professional – Options

Advanced Performance Management (APM)

March/June 2019 – Sample Questions



APM

Time allowed: 3 hours 15 minutes

This question paper is divided into two sections:

Section A – This ONE question is compulsory and **MUST** be attempted

Section B – BOTH questions are compulsory and **MUST** be attempted

Present Value and Annuity Tables are on pages 8 and 9.

Do NOT open this question paper until instructed by the supervisor.

This question paper must not be removed from the examination hall.

Think Ahead



The Association of
Chartered Certified
Accountants

Section A – This ONE question is compulsory and MUST be attempted

1 Folt Manufacturing: Company information

Folt Manufacturing (Folt) is a company, which is majority owned by its management team. A number of years ago, it was bought out of a larger multinational business by the management team. The management were supported by a venture capital firm, who provided the remaining equity and now supply all the debt required by the business at market rates. The business manufactures and sells digital imaging devices for use in a variety of industrial situations. A key component in its products is the image processing software which is included. Folt has a small team of software developers who are beginning to gain a reputation for innovative solutions.

Folt has faced increasing pressure in its home market of Beeland from manufacturers in countries with lower cost bases. As a result, it has decided to invest in developing its image processing software rather than compete on the manufacturing of the hardware (the imaging devices). It will continue to sell the imaging devices but the manufacturing will be outsourced.

Folt's overall objective is unchanged and it is 'to provide an adequate return to its capital providers while growing the business into a world-class supplier in its areas of expertise'. The chief executive officer (CEO) has identified three factors which are critical success factors (CSFs) to achieving this objective. These are:

1. Keep capital providers satisfied;
2. Build a world-class software development team; and
3. Ensure that quality of the imaging devices meets market standards.

Performance measurement system

The CEO requires assistance from a performance management expert to create an appropriate performance measurement system for Folt. First, he needs recommendations of suitably justified key performance indicators (KPIs) for each CSF. The CEO has indicated that there should be a maximum of two KPIs per CSF in order to avoid information overload. Then, he wants an assessment of the use of this group of KPIs to measure the strategic performance of Folt.

Outsourced manufacturing: Initial plans

The company has selected a suitable manufacturer for the outsourced work. Xela Manufacturing (Xela) is based in Ceeland, which is a much lower cost environment than Beeland. Folt is preparing to enter into detailed contract negotiations with Xela.

The manufacturing will be done under licence from Folt. This means that Folt supplies the product designs but retains the intellectual rights to them and Xela manufactures to agreed standards of quality. Xela then despatches the devices back to Folt who add the software, package the product and send it to their customers. The quality standards will be set by the service level agreements (SLAs) which will be agreed in the contract.

In preparation for these negotiations, the CEO needs advice on the following three critical areas (target costing, responsibility for quality areas and sources of information) for the negotiation of the agreement.

Target costing

The CEO realises that he needs to understand the cost structure of the products in order to have a firm basis for price negotiation with Xela. He has heard that target costing could be helpful. Therefore, he needs to know how target costing works and how it might be used in this situation. In order to clarify the explanation, he has gathered information (Appendix 1) on one product (Product 123) which requires a redesign before being relaunched into the market. He wants an example calculation of the target cost gap and an explanation of how the result of this would impact on negotiations with Xela.

Responsibility for quality areas

The maintenance of existing quality is a critical concern for Folt, since it will focus on software as the key selling point but this will not be sufficient for market success if the hardware does not meet market standards. The CEO wants to understand, in terms of the four areas of quality costs, how responsibility for each area should be attributed between Folt and Xela.

Sources of information

Folt has appropriate information systems in place for its existing manufacturing operation. The CEO and board are happy with their operation at present. However, Xela has indicated that its current information systems are purely financial, aiming to collect the required information for its financial reporting duties. The CEO is worried about this and wants an assessment of the impact of this on the management of quality within the contract.

It is now 1 September 20X5.

Required:

Write a report to the CEO of Folt Manufacturing (Folt) to:

- (i) Recommend the key performance indicators and evaluate them as required by the chief executive officer (CEO). (16 marks)
- (ii) Respond to the CEO's request for work on target costing. (10 marks)
- (iii) Explain the four quality cost areas and evaluate how to divide responsibilities for these under the outsourcing contract. (11 marks)
- (iv) Assess the impact of the sources of information on the management of quality within the outsourcing contract. (9 marks)

Professional marks will be awarded for the format, style and structure of the discussion of your answer. (4 marks)

(50 marks)

Appendix 1

Information on Product 123

The company aims for a profit margin of 20% on Product 123. Target price is \$175 per unit, based on sales and marketing department research.

Cost details:

1. The remaining commercial life of the product is two years.
2. It is estimated that 250,000 units will be sold over the remaining life of the product.
3. Materials cost \$37 per unit.
4. Each unit will take 0.5 hours of labour at an average cost of \$25 per hour.
5. Each unit will use 1.1 hours of machine time at an average cost (including overheads) of \$32 per hour.
6. Packaging and delivery will cost \$8 per unit.
7. The design costs of the unit are expected to total \$2m.
8. Inspections cost \$100,000 per annum – the redesign will not affect this.
9. The rate of failed products, either spotted by customers or by the inspection team, is expected to remain at 2.5%.
10. Failed products will be reworked at an average cost of \$20 per unit.
11. The software package supplied by Folt costs \$40 per unit.

Section B – BOTH questions are compulsory and MUST be attempted

2 Vunderg: Company information

Vunderg manufactures windows and related products. The overheads in the business are high and primarily relate to procurement, customer administration and product design. Procurement and customer administration overheads relate to all of Vunderg's product groups. Design overheads currently relate to only two product groups, glasshouses and conservatories. Vunderg's current costing system has been in use for a long time and absorbs overheads into product costs on a direct labour hours basis. The current costing system does not involve identifying the factors which drive the costs of the company's activities and allocating overheads to products based on their usage of those factors.

Current product range

Windows

For many years, Vunderg has manufactured UPVC window frames used for residential house building. Vunderg buys the glass from an external supplier, inserts it into a frame and sells the completed window units to a small number of large construction companies. These window units all have standard designs, specifications and sizes. This market is very competitive, and Vunderg must offer a complete range of windows for sale to the construction companies.

Glasshouses

Five years ago, Vunderg developed a range of small garden glasshouses, for non-commercial use, made of attractive and high quality materials. After initial quality problems due to the use of materials and manufacturing methods new to Vunderg, glasshouse production is now efficient, quality is high and the glasshouses now command premium prices. The glasshouses are sold nationwide through 40 retailers, who vary significantly in the size of orders they place and the level of customer support and trade discounts which they receive from Vunderg. As a result, the profitability of selling to different retailers, or types of retailer, varies significantly.

Conservatories

More recently, Vunderg began manufacturing conservatories* using the same materials as its glasshouse range. These conservatories are expensive and are made to measure for individual customers' houses. There are a wide range of finishes and options available to choose from. Conservatories which match garden glasshouses have become popular with customers who can afford them. Unlike Vunderg's other products, these are sold directly to individual home owners.

* Conservatories are structures made mainly of glass, which are attached to the side of residential houses. They form an additional room in a house and are popular in cool climates.

Future product development

Vunderg is looking to move into another new market soon, as the market for making windows for houses is now saturated. This new market will be the manufacture and design of large windows to be installed in the entrance halls of large, prestigious commercial buildings. These will be bespoke items, designed and manufactured to customers' own specifications.

Recent performance

The CEO is concerned by a recent fall in overall net profit margin despite modest revenue growth and good control of direct costs. In particular, he has said, 'The conservatories part of the business may not be as profitable as its positive contribution (Appendix 1) may suggest. For example, our procurement department spends a lot of time sourcing special materials and finishes requested by customers. Many conservatories have leaked in the rain so we have to rectify these faults and work on a new design to prevent this happening. As we have only basic information systems, it is unclear how much some of these activities are costing. Over 20% of our factory space is dedicated to manufacturing conservatories. We may be better off discontinuing these products.'

The CEO has some experience of activity based costing (ABC) in a previous role and believes that activity based management (ABM) could help to improve Vunderg's strategic performance. He is keen to know what the limitations are of using the ABM method for Vunderg's products and customer types and the problems with its implementation before he makes a decision to implement it.

It is now 1 September 20X5.

Required:

(a) Advise the CEO how activity based management (ABM) could help improve the strategic performance of Vunderg. (13 marks)

(b) As required by the CEO, assess the limitations of using the ABM method for Vunderg's products and customer types and the problems with its implementation. (12 marks)

(25 marks)

Appendix 1

Contribution by product type for the year ended 30 June 20X5

Product type	No. of units sold	Total contribution (\$'000)
Windows	175,000	9,800
Glasshouses	3,800	969
Conservatories	650	910

3 Cortinas Retail Clothing (CRC): Company information

CRC started as a clothing retailer 20 years ago with one store. The business expanded steadily and had 10 stores after 18 years of trading. Since then, the rate of expansion has increased rapidly with an average of four stores opening per year.

CRC is planning to open its first large out of town store soon and is also considering the acquisition of a food retailing business. Both of these will be supplied with items using CRC's existing central warehouse.

Introduction of RFID system

At the beginning of the 20X5 accounting year, to cope with this rapid growth, CRC acquired a RFID (radio frequency identification device) system at its single central warehouse. This was to help manage inventory more effectively and speed up the processes for receiving items from suppliers and despatching them to stores. Items are still moved manually by staff in the CRC warehouse where there is little automation compared to competitors. There has been some resistance from staff to the RFID system, which they find difficult to use. CRC is currently trying to reduce the number of suppliers it has to help increase efficiency in the warehouse.

Budgeting system

The budget setting process has remained unchanged since CRC was formed. All managers prepare draft budgets using spreadsheets and submit them to the CRC board for approval. Managers use the previous year results as a starting point when drafting the budgets and increase the variable costs in line with any anticipated growth in volumes. For example, when preparing the budget for the year ending 30 June 20X6, the manager of the central warehouse used the actual costs of running the warehouse from the previous year and increased them all by the same percentage. This was to reflect an anticipated increase in volumes in 20X6 over 20X5. Managers are appraised on their performance against the approved budgets.

CRC has needed all its financial resources to fund its expansion and so it has only old and basic IT systems which are not enterprise resource planning systems, unified databases or networked systems.

It has been suggested to the CRC board that the current system of budgeting is no longer suitable and that the business should move to activity-based budgeting (ABB). The CEO has asked you to evaluate the potential introduction of ABB at CRC.

Central warehouse activity in July 20X5

The board has never seen an activity-based budget before and is unsure how it could be used to explain variances between actual and budgeted performance in the central warehouse. As an example, they would like to see how an activity-based budget for the year ending 30 June 20X6 could be used to explain variances from the actual results for

the month of July 20X5.

The two key activities which drive costs in the central warehouse are receipts of items into the goods inwards section and despatches of items from the goods outwards section. A receipt into good inwards involves accepting a delivery of items from a supplier, tagging those items and putting them away in the warehouse. Receipts from suppliers contain variable numbers of individual items. Despatches of items from goods outwards are to CRC's own retail stores. Cost driver rates for these two activities will be used to set monthly cost budgets for the warehouse.

The board asked an analyst to prepare an activity-based budget for the central warehouse for the year ending 30 June 20X6. The analyst has collected relevant information on the costs for the year needed to prepare the activity-based budget and has begun the work (Appendix 1).

The total annual cost relating to goods inwards needs to be determined. This should be used to calculate the budgeted cost of each receipt into goods inwards, in order to explain the variance between the budgeted cost and the actual cost of receipts of goods inwards for the month of July 20X5. The analyst has already correctly included the costs of the warehouse manager's salary and the lease of the RFID system into the incomplete activity-based budget in Appendix 1. The board has asked you to complete the analyst's work.

To enable you to complete your calculations, you are told that in July 20X5 there were 650 receipts into goods inwards. These receipts contained 100,000 items, which is the same as the budgeted number of items for the month. The actual total cost of activities driven by receipts into goods inwards for the month was \$18,000.

It is now 1 September 20X5.

Required:

(a) Evaluate whether CRC should move from its current budgeting system to ABB. (13 marks)

(b) Complete the analyst's work in Appendix 1 as required by the board and explain the variance between the budgeted cost and the actual cost for each receipt into goods inwards for July 20X5. (12 marks)

(25 marks)

Appendix 1

Analyst's incomplete activity-based budget for the central warehouse for YE 30 June 20X6.

	Total	Goods inwards	Goods outwards	Other
	\$	\$	\$	\$
Warehouse manager's salary ¹	55,000	–	–	55,000
Lease of RFID system ²	75,000	45,000	30,000	–
RFID tagging ³				
Warehouse staff wages ⁴				
Heating and lighting ⁵				

Sub-total cost of activities driven by the receipt of goods inwards

Analyst's notes

Relevant information on costs in the central warehouse for the year ending 30 June 20X6

1. The cost of the warehouse manager's salary relates to all sections of the warehouse and cannot be apportioned directly to goods inwards or goods outwards.
2. The cost for the RFID system is invoiced by a lease company. 60% of this cost is allocated to goods inwards and the remainder relates to goods outwards.
3. The cost of RFID tagging is the wages cost for specially trained staff, known as taggers. Their only job is to attach RFID tags to items when they are received, before the items are put away in the warehouse. All items received are RFID tagged and the costs of tagging are allocated entirely to the cost of goods inwards. Each tagger can attach 35,000 tags per month and is paid an annual salary of \$24,000. The cost of each individual RFID tag is negligible.
4. There were 12 full-time warehouse staff throughout the year to 30 June 20X5 who were each paid an annual salary of \$22,500. Two more staff will be recruited at the beginning of the new budget year. 50% of the warehouse

staff work in goods inwards and 50% in goods outwards.

5. The cost of heating and lighting relates to all sections of the warehouse and cannot be apportioned directly to goods inwards or goods outwards. The actual heating and lighting cost for last year was \$10,000 and the warehouse manager has proposed a budget of \$10,500 for the coming year. The general cost of inflation though is expected to be zero.
6. The annual number of receipts into goods inwards expected is 9,000, containing a total of 1,200,000 items. These are expected to occur evenly over the year.

Answers of Above Question Paper

Strategic Professional – Options, APM
Advanced Performance Management (APM)

March/June 2019 Sample Answers

- 1 To: The CEO of Folt Manufacturing (Folt)**
From: An Accountant
Date: September 20X5
Subject: Performance measurement and outsourcing of manufacturing at Folt

This report recommends a set of key performance indicators (KPIs) for the identified critical success factors (CSFs) associated with the new strategy and evaluates these as a set of measures of the strategic performance of Folt. Further, in preparation for the negotiation of the outsourced manufacturing contract, advice is given on the use of target costing; the attribution of responsibility for areas of quality and the information required to monitor the quality of production.

(i) Recommended KPIs for CSFs

The chief executive officer (CEO) has identified three critical success factors (CSFs) for the medium term. Performance towards these requires to be measured and so KPIs are recommended as follows:

1. Keep capital providers satisfied

There are two capital providers, the debt is all provided by the venture capitalist (VC) and the equity is provided by the management team and the VC combined with the management team taking the majority. A widely used and understood metric for performance would be return on capital employed (ROCE) which measures the returns to all capital providers as a group. It is defined as operating profit/capital employed. In order to properly understand performance, a target measure should be set for this, possibly by using an industry average as benchmark.

To break this down further would probably require return on equity and cost of debt measures and would, therefore, break the desire to keep the performance information brief. As there are only two capital providers and ROCE neatly summarises this, no other KPIs are suggested.

2. Build a world-class software development team

This is a difficult factor to measure with precision. Building a team could be measured by an increasing number of employees or number of projects undertaken. However, the important element in this CSF is the 'world-class' quality of the team. This could be measured by the input cost of the team, provided that they are recruited at competitive market rates, since higher wages would imply higher skills. Alternatively, it could be measured by the team's output in terms of commercial success (sales) or technical achievement (industry design awards).

Overall, therefore, being led by the output of the team, it is recommended that we use growth in number of projects undertaken and the number of industry design awards won as the KPIs for this CSF.

3. Ensure that quality of the imaging devices meets market standards

Again, this is a difficult factor to measure. Financial measures of quality are possible by looking at the effect on sales volume and profitability (both likely higher for higher quality). However, these are lagging indicators where quality effects can take some considerable time to trickle through to customer perceptions.

A more direct measure of the quality of current manufacturing would be through customer returns and product failure rates on factory testing. However, it can be difficult to obtain benchmarking information which will allow judgement of whether this is meeting market standards. Given that the company already does manufacture successfully, it should have historic data which, if products are selling at the required margins, would suggest that these data on failure rates and returns would be acceptable to the market. As the business is moving to outsourcing its manufacturing, it is the external failure rate data of the customer returns which will be more appropriate as Folt will retain the key contact with the customer.

Overall, it is recommended that gross profit (a measure of both volume and profitability) of products and value of customer returns be used as KPIs. Both of these will need to be benchmarked to historic values in order to judge the maintenance of standards.

Performance measurement system

The KPIs suggested are:

- ROCE
- growth in number of projects undertaken
- growth in number of industry design awards won
- gross profit and
- value of customer returns.

The question of whether this is a suitable set of metrics to measure strategic performance really asks, does this measure the achievement of Folt's overall objective 'to provide an adequate return to its capital providers while growing the business into a world-class supplier in its areas of expertise'.

This objective can be broken down into:

- to provide an adequate return to its capital providers
- growing the business
- being a world-class supplier in its areas of expertise.

These KPIs do address the first part through ROCE and the second part partly, through building the software team. However, the overall growth of the business is not measured financially through sales or profits and its target of being world-class is not measured through the number of markets which it has entered and is considered a leader. The final two KPIs have a more supporting role to play for the overall objective and these could be replaced by others measuring the concepts of growth and world-class supplier in order to provide a strategic view for the board of whether the company's mission is being achieved.

[Tutor note: Credit is given for suitably justified metrics and then a consistent discussion of this in relation to the objectives of Folt.]

(ii) Outsourced manufacturing: target costing

Working (per unit):

	\$	\$
Target price		175.0
Target profit		35.0
Target cost		140.0
Costs:		
Software	40.0	
Materials	37.0	
Machine costs	35.2	
Labour	12.5	
Packaging and delivery	8.0	
Design	8.0	
Inspections	0.8	
Reworking costs	0.5	
Total costs		142.0
Cost gap		2.0

[**Note:** It is assumed that it is the total design costs which are relevant to pricing the product although it would also be possible to consider the original design costs as sunk and so only include the redesign element.]

The target cost is calculated as the estimate of a competitive product price less the desired profit margin.

The illustrative calculation above shows that the current estimated cost is \$2 per unit too high and so the product or the manufacturing process will need to be redesigned to cut these costs in order to meet the desired margin.

The costs will be split under the contract between the two parties. Therefore, Folt could press Xela to make cuts in its costs to meet the cost gap as the gap is not large (2.3% of the total costs for manufacturing [i.e. excluding software, design and packaging and delivery]) and it is stated that Ceeland is a lower cost environment than Beeland for manufacturing. However, it may be dangerous to Folt's strategy if these cuts adversely affect product quality.

(iii) Responsibility for quality areas within outsourced manufacturing

This discussion relates to the quality of the manufactured device and should exclude issues with the software, packaging and delivery which remain Folt's responsibility. Taking each of the four areas of quality costs in turn, the cost area is defined and the appropriate treatment under the contract discussed:

- Prevention costs are incurred to prevent the production of products which do not conform to specification (e.g. design of the product and manufacturing process). The product design costs will obviously lie with Folt and the costs for design of

the manufacturing process will lie with Xela, although it would be sensible for Xela to replicate Folt's current process and indeed this may be required in order to maintain quality. However, Xela may want autonomy on this in order to make further gains from streamlining processes. There will need to be liaison between Folt and Xela to ensure that process designs are acceptable to both parties.

- Appraisal costs are costs to ensure that the products output by the manufacturer conform to standards. These costs will mostly lie with Xela as it will be the manufacturer. However, Folt will have to oversee this appraisal by checking on the quality data which Xela will supply under the contract.
- Internal failure costs arise when poor products are identified before despatch. These costs will remain the responsibility of the manufacturer (Xela) as they have control of the manufacturing facility and the appraisal operation there.
- External failure costs arise when poor products are identified after despatch to the customer. Where these costs relate to repair or replacement of faulty hardware products, they should lie with the manufacturer. It is worth noting in price negotiations that there are additional costs for Folt from these failures beyond immediate reworking costs, such as the impact on Folt's brand.

There may be reasonable argument from Xela that Folt should bear some of the non-conformance costs (internal and external failure) if the faults can be attributed to faulty product design work.

Obviously, all of these matters are subject to negotiation before the contract is finalised.

(iv) Impact of sources of quality information

The maintenance of quality standards is a critical success factor for Folt. The ability to ensure this is based on the SLAs in the manufacturing contract with Xela. The monitoring of these SLAs will be done through information systems and so the quality and reliability of the information is critical to Folt's success.

The outsourcing contract must stipulate agreed quality metrics and also the targets for performance. These will have to be measured and reported by Xela to Folt. Xela does not at present have information systems which are capable of capturing the non-financial data which is likely to be required by the SLAs. It must therefore be a condition of the contract that suitable systems are put in place by Xela.

In fact, a simple solution would be for Xela to duplicate the existing systems at Folt. This would avoid the need for Folt to authorise (under the contract) any new system as it would then have a familiar one. It will also mean that the format of the reports is familiar and this too will ease the handover of operations.

However, this new system will be owned and operated by Xela and so Folt will need to have access to it in order to verify that data is being input, processed and reported accurately. The detailed type of system audit work may be new to Folt. However, again by using the same system as currently exists, it should be possible to identify managers who monitor quality at Folt's existing manufacturing operation, to perform this task.

In summary, it will be important that any metrics and targets for these which are used under the contract are unambiguous. It will also be important to stipulate in the contract that Folt be given access to verify that this information is being produced accurately. This will help to avoid the possibility of gaming the contract by Xela.

Ultimately, customer complaints and returns will represent an external source of information on the quality of the products manufactured. However, it would be more effective to identify and address problems before they reach customers.

2 (a) Activity based management

Activity based management (ABM) applies activity based costing (ABC) principles in order to satisfy customer needs using the least amount of resources. Activity based costing groups overheads into cost pools for an activity and identifies the cost driver for each activity. This gives a more accurate calculation of product costs.

ABM makes it possible to better control costs by controlling the activities which drive the costs. ABM would also help Vunderg to identify value added activities and non-value added activities. Activities which do not add value should be reduced, which would allow cost reduction without affecting the quality of service or product for Vunderg's customers.

Choosing which products to manufacture

ABM can help to improve Vunderg's performance in terms of deciding which products to manufacture. This is particularly important where a large proportion of a company's costs are overheads. This is the case in Vunderg, where overheads relating primarily to procurement, customer administration and product design are high. By understanding the cost of a product, and therefore its profitability, Vunderg can decide whether to discontinue an unprofitable product or whether to produce a new one. This will be relevant for the proposed large windows for commercial buildings. These are bespoke items and the cost will include a large amount of overheads, such as design.

Loss making products identified using ABM are often those which are highly customised and produced in low volumes, such as the conservatories. By using ABC principles, Vunderg could identify the high overhead costs of the sourcing of special materials and finishes for these by the procurement department. Using ABM, Vunderg could take action to reduce these costs, for example, by standardising the range of materials and finishes used, so that the procurement department spends less time sourcing them. The conservatories earn 8% of Vunderg's total contribution in 20% of the factory space. This implies that conservatories account for a disproportionate level of factory overheads.

Review of costs, prices and designs

By understanding what drives the costs of a product, Vunderg can take actions to make an unprofitable product profitable, for

example, in response to the initial quality problems when the glasshouses were first manufactured, but which now command premium prices. The use of ABM may have led to a faster resolution of these initial quality problems by identifying the causes, or drivers, of the product cost and taking action to manage these.

ABM will also help identify products which may need to be re-priced. For example, customers may be prepared to pay more for the use of special materials and finishes in the conservatories. Vunderg could charge customers more for the use of special materials and finishes to cover the high overhead cost associated with procuring them.

ABM may identify possible improvements to the design of a product by focusing on activities which add value for the customer and eliminating those which do not. Selling leaking conservatories does not add value to the customer and incurs rectification costs. The improvement in design to prevent the leaks occurring in the first place is an example of how ABM can be used to make the conservatories business more profitable.

Customer profitability analysis

Customer profitability analysis (CPA) involves apportioning overhead costs to different types of customers, or categories of customers, using ABM principles. This enables a better understanding of the profitability of selling to different customers and can help Vunderg to decide whether to stop selling to certain customers or take other actions to improve their profitability.

At Vunderg, CPA would be most useful for the glasshouses which are sold through 40 different retailers. Some of the costs of selling to these customers, such as trade discounts, should be relatively easy to identify. Other overhead costs, such as those driven by the number of customer orders processed, may only be identified using ABM principles and may differ considerably between customers as the size of orders they place varies greatly.

The profitability of selling to the 40 retailers will therefore also vary considerably. Vunderg could act to improve the profitability of the least profitable ones. This could include insisting on minimum order sizes to reduce the costs driven by the number of orders processed. They could also offer more product training or contribution towards advertising costs to increase sales volumes.

(b) Limitations of using the ABM method

Identifying key activities and drivers

It may be difficult to separately identify all of the key activities and what drives them, which makes the application of ABC principles difficult. It may also be hard to assign responsibilities for individual cost pools which may cut across departmental boundaries.

Limited use

ABM is most useful where products are customised and contain high overhead costs such as design, procurement and customer administration. While the use of ABM may be worthwhile for the conservatories business, which is highly customised, and for the bespoke windows for commercial buildings, 84% (9,800/11,679) of Vunderg's contribution is from windows used in residential housing. These are highly standardised and are likely to include few overhead costs, for example, relating to design and after sales service. The manufacturing process after many years will already be efficient. The costs may already be well understood and controlled, in which case the implementation of ABM may not be worthwhile. Vunderg does, however, need a good understanding of the overhead costs, as the residential windows market is competitive.

As windows are highly standardised, Vunderg may be unable to pick and choose which items to produce. Design, specification and size will be dictated by the large construction companies who buy them and who will expect Vunderg to supply a complete range of windows. These companies would just buy from a competitor if Vunderg stopped producing the items they needed. As this market is very competitive, there may be little Vunderg could do to improve profitability, for example, by increasing prices, so the use of ABM to choose which products to sell could therefore be of little use. Similarly, as there are only a few large construction companies, the use of ABM may also not be worthwhile as Vunderg could not realistically stop trading with any one of them, nor could it raise prices because of the competitive market.

Incorrect decisions

Despite the difficulties in using ABC, for example, in identifying cost drivers, the use of cost drivers to charge overhead costs to conservatories should give a clearer indication of their profitability than under the current system. Vunderg can then take action to increase the profitability of these products, for example, by increasing the prices or reducing the costs.

The decision on whether these products should be discontinued should, however, take into account the effect on glasshouse sales as customers like to buy glasshouses which match the materials used in the conservatories. Discontinuing conservatories could reduce contribution from glasshouses by up to 17.1% (650/3,800), a total loss of contribution of approximately \$166,000 (17.1% of \$969,000), which is significant. As conservatories are at the start of their life cycle, expecting them to be profitable immediately could be unrealistic.

Just because a large proportion of factory space is dedicated to manufacturing conservatories does not mean that these costs will be saved in the short term if the products are discontinued. The depreciation or lease costs of the factory are fixed. Vunderg's main business is saturated and there is no prospect that the factory space could be better used in making other products. The factory may already not be fully utilised.

Problems of implementing ABM

Resource and cost impact

As Vunderg does not have an ABM system, considerable resources and management time will be needed to set this up. There may be resistance from staff, for example, because they do not want to change from the current costing system, which has been in use for a long time. Staff may not understand the benefits of ABM, or how it works. They would need training, which

is expensive and it may take a considerable time before ABM is working effectively.

As Vunderg has only basic information systems, it may need to invest in these in order to collect large volumes of data on costs. Vunderg will have to consider whether the benefits of implementing ABM are greater than the costs of doing so.

3 (a) Advantages of the current budgeting system

CRC managers use the previous year results as a starting point when drafting their budgets and increase the variable costs according to any anticipated growth in volumes. This is an example of incremental budgeting.

An advantage of incremental budgeting is that it is quick and easy to prepare. The budgeting system at CRC has remained unchanged for a long time and it is unlikely managers will have experience in any other method of budget setting. While CRC was growing steadily, and relatively slowly at approximately one new store approximately every two years (approximately 18 years/10 stores), the use of incremental budgeting may have been appropriate. But as CRC is now entering new locations, such as out of town shopping centres and possibly food retailing, incremental budgeting is unlikely to be appropriate.

Incremental budgets can also be flexed according to anticipated activity levels. The manager of the central warehouse has done this, rather simplistically, by increasing costs of running the warehouse to reflect the anticipated increase in volumes in 20X6.

Disadvantages of current budgeting system

The use of incremental budgets can encourage slack. This includes incorporating extra costs into the budget to make it more achievable, or spending up to the budgeted amount to ensure that a larger budget is set next year. This may be particularly so at CRC, as managers are appraised based on achieving their budget. The manager of the central warehouse appears to be building in slack by increasing the budget for heating and lighting when the general rate of inflation is zero. This will make it more likely that the manager will receive a positive appraisal next year as it will be easier to achieve the budget.

Incremental budgeting does not encourage CRC to look for new and innovative ways of doing things. The level of automation in the warehouse is lower than in competitors and CRC appears to have just increased the budget for more staff to manually handle items in response to increased volumes. The introduction of the RFID system is, though, an example of the use of technology to increase efficiency in the warehouse.

Incremental budgeting is only appropriate where costs are already well controlled and operations are efficient. Otherwise, poorly controlled costs and inefficiencies are just incorporated into the next period's budget. Staff resistance to the introduction of the RFID system, and their difficulties in using it, suggest that this might not be the case.

Advantages of activity-based budgeting (ABB)

The principle of ABB is that it is activities, such as the goods inwards and goods outwards in the central warehouse, which drive costs. By understanding what drives the cost, such as the number of receipts from suppliers and the number of despatches to stores, CRC can take action to control the drivers of the costs and eliminate activities which are not value adding. ABB is particularly useful where overhead costs form a large part of total costs.

ABB can help identify critical success factors which CRC must do well, such as being able to put items away in the warehouse quickly and accurately and to retrieve them efficiently. This is more likely to be done right first time as ABB focuses on the whole of an activity.

ABB is useful as CRC is changing the nature of its operations. It is undergoing rapid expansion by opening four new stores a year. There is also likely to be a change in the nature of its business, with the opening of its first out of town store and possible acquisition of a food retailing business. The incremental approach to budgeting may no longer be appropriate given the scale and nature of these changes. ABB may be more suitable as the business becomes more complex.

Disadvantages of activity-based budgeting (ABB)

One of the main disadvantages of ABB is the time and resources which are needed to implement it, for example, by identifying activities and their costs drivers. In the short term, overheads may not be controllable which will reduce the benefits of implementing ABB.

CRC has used all its financial resources to fund its expansion and has only old and basic IT systems compared to its competitors. Its current systems are not enterprise resource planning systems (ERPS), unified databases or networked systems. Significant investment in CRC's IT systems will be needed to collect and process large volumes of data on cost drivers and activities which would be required to implement ABB. There may also be resistance to the change from staff, who may also require extensive training, as they will be unfamiliar with the ABB approach.

Conclusion

CRC should adopt ABB, mainly as a response to the significant changes in the business and its increasing complexity.

The out of town store and the food retailing business will both be supplied from CRC's existing central warehouse. The nature of these businesses may be different from the existing business. For example, out of town stores may require despatches each containing a larger number of items from the goods outwards section. Food retailers may require smaller, more frequent despatches to prevent spoilage. The current approach of incremental budgeting, in the central warehouse at least, is unlikely to be appropriate. The benefits of implementing ABB do, however, need to be compared to the financial cost and disruption of

doing so.

(b) Activity-based budget for the central warehouse for YE 30 June 20X6

	Total \$	Goods inwards \$	Goods outwards \$	Other \$
Warehouse manager's salary*	55,000	–	–	55,000
Lease of RFID system*	75,000	45,000	30,000	–
RFID tagging (W1)	72,000	72,000	–	–
Warehouse staff wages (W2)	315,000	157,500	157,500	–
Heating and lighting (W3)	<u>10,000</u>	<u>–</u>	<u>–</u>	<u>10,000</u>
Total	<u>527,000</u>	<u>274,500</u>	<u>187,500</u>	<u>65,000</u>
Annual number of receipts into goods inwards expected		9,000		
Cost (\$) per receipt into goods inwards		30.50		
		(274,500/9,000)		

*As already calculated by the analyst

Comments on variance analysis

The total expected cost for receipts into goods inwards for July 20X5 was \$19,825 (\$30.50 budgeted cost per receipt x 650 receipts). The actual cost was \$18,000 giving a favourable variance of \$1,825. It cannot be identified, on the basis of the information available, the cause of the \$1,825 variance, as the breakdown of the \$18,000 actual cost would be required.

100,000 items were processed in July 20X5 which is the same as the budgeted amount. However, the number of receipts budgeted was 750 (9,000/12), whereas the actual number of receipts was only 650, equivalent to \$27.69 (\$18,000/650) per receipt. This is a favourable variance of \$2.81 per receipt.

It appears that the favourable variance may be due to the receipt of larger quantities of items from suppliers in each delivery. If some of the goods inwards costs are variable with the number of items this would result in a cost saving. This could be because of the reduction in the number of suppliers, with fewer suppliers individually supplying more items.

W1 – RFID tagging

Expected volume of items received in the month = 100,000

Each member of staff can tag 35,000 items per month, so 2.86 (100/30) staff are required – say 3

Annual wages cost is 3 x \$24,000 = \$72,000

W2 – Warehouse staff wages

Number of staff required in budget year = 14 (12 + 2)

Total warehouse staff wages = 14 x \$22,500 = \$315,000

Of which \$157,500 (50% of \$315,000) relate to each of goods inwards and goods outwards

W3 – Heating and lighting

As inflation is zero the cost included in the budget should be \$10,000.

Strategic Professional – Options

Advanced Performance Management (APM)

September/December 2019 –
Sample Questions



APM

Time allowed: 3 hours 15 minutes

This question paper is divided into two sections:

Section A – This ONE question is compulsory and **MUST** be attempted

Section B – BOTH questions are compulsory and **MUST** be attempted

Present Value and Annuity Tables are on pages 10 and 11.

Do NOT open this question paper until instructed by the supervisor.

This question paper must not be removed from the examination hall.

Think Ahead

ACCA

The Association of
Chartered Certified
Accountants

Section A – This ONE question is compulsory and MUST be attempted

1 Company information

Arkaig Manufacturing (Arkaig) is a world-leading, listed manufacturer of production machinery for other industries. It has customers in the mining, cement and chemicals sectors and seeks to provide them with the equipment, software and service for their products.

The aim of Arkaig is 'to maximise shareholder wealth by providing world-class, tailored automation solutions, which use technology innovatively, show improved machine downtime and reduced energy consumption for our customers.' This is supported by an entrepreneurial culture among all employees who should 'treat the business as if they owned it'.

Strategic internal performance reporting

There has been criticism of the business' current performance reporting by one of the directors at a recent board meeting. However, the chief executive officer (CEO) believes that the reporting system, which he put in place two years ago, is an excellent one.

In preparation for the next board meeting, the CEO needs an evaluation of the current report. As an example, a recent report used by the board for its strategic review is given in Appendix 1. The CEO stressed that it was the report and not the performance of the business which should be evaluated.

Economic value added

Another criticism of the performance management of Arkaig was that it lacked an over-arching measure of performance. As a result, the CEO is considering the introduction of economic value added (EVA™) to replace return on capital employed (ROCE) as a principal performance measure. The CEO wants to present this idea at the next board meeting and so needs an illustrative calculation of EVA™ along with a brief explanation of its benefits as a replacement for ROCE. The data in Appendix 2 should be used for the calculation.

Performance hierarchy

The earlier work requested focuses on the strategic level of the organisation and the CEO is keen to ensure that the other levels of the organisation (tactical and operational) do not get ignored in this discussion. However, before undertaking any specific work, he wants to make a presentation at the next board meeting. Therefore, he wants you to provide him with a brief description of the nature of the information required for performance measurement at these three different levels and explain how this information is influenced by the extent of planning and controlling activity at each of the levels of the performance hierarchy. He wants examples which would be relevant to Arkaig to illustrate these points in order that the presentation is made more concrete for the directors. He will then prepare the slides for the presentation himself.

Value chain

In order to analyse the operational aspects of Arkaig, the CEO has employed a consultant to produce a value chain analysis (Appendix 3). The value chain analysis has highlighted certain critical activities within Arkaig where there was concern about the performance management aspects. The CEO would like you to assess the performance management implications of the consultant's comments on the critical areas identified for Arkaig.

Required:

It is now 1 September 20X5.

Write a report to the chief executive officer (CEO) of Arkaig to respond to his instructions for work on the following areas:

- (i) the performance reporting at Arkaig;** (11 marks)
- (ii) the introduction of economic value added (EVA™);** (15 marks)
- (iii) the information requested on the performance hierarchy;** (10 marks)
- (iv) the value chain analysis prepared by the consultant.** (10 marks)

Professional marks will be awarded for the format, style and structure of the discussion of your answer. (4 marks)

(50 marks)

Appendix 1

Arkaig: Strategic performance report

	Year ended 30 June 20X5				Previous year	Industry average
	Mining	Cement	Chemicals	Total	Total	
	20X5	20X5	20X5	20X5	20X4	
Orders (\$m)	5,204	6,898	5,900	18,002	17,878	
Revenue (\$m)	5,100	6,756	5,784	17,640	18,166	
Revenue growth (%)	0	-1.8	-6.5	-2.9		
Net profit (\$m)	220	350	302	872	798	
Net profit margin (%)	4.3	5.2	5.2	4.9	4.4	4.6
ROCE (%)	16.1	17.3	17.4	16.8	15.7	15

Commentary:

1. The company has increased its return on capital employed on the previous year and exceeded the industry benchmark.
2. Revenue has fallen by 2.9% on the previous year but the order book has grown by 0.7%, indicating sustained sales levels going forward.
3. The net profit margin has increased to 4.9%, again exceeding the industry benchmark of 4.6%.
4. The company has continued to emphasise its entrepreneurial culture to its employees.

Appendix 2

Economic value added

The following details have been gathered for the 20X5 EVA™ calculation:

1. The operating profit of Arkaig was \$3,175m. This includes a depreciation charge of \$1,780m.
2. Amortisation charges of \$95m in the year have been incurred.
3. The corporation tax rate is 25%. Tax of \$694m was paid in the year.
4. The company has spent \$90m this year and each year for the previous 10 years on long-term brand building.
5. The economic depreciation for the year is estimated to be \$1,907m.
6. This year and each year for the previous 10 years, economic depreciation has included a \$10m write-down of the value of brand building.
7. Research and development expenditure of \$705m was incurred in the period leading to an economic asset of \$4,233m at the year end.
8. Interest paid in the period was \$213m.
9. Capital employed during the period (from the statement of financial position):

	\$m
Opening	19,404
Change in period	977
Closing	<u>20,381</u>

10. Costs of capital:

Equity	12.0%
Debt (pre-tax)	3.8%

11. Gearing: 45% debt/(equity + debt)

Appendix 3

Value chain analysis

Primary activities:

- Inbound logistics (receiving, handling and storing inputs) – Warehouse and distribution operations are controlled by an old information system which feeds into operations management information.
- Operations – Not a critical area of concern at present.
- Outbound logistics (delivering the product to customers) – Warehouse and distribution operations are controlled by an old information system which is fed from operations management information.
- Marketing and sales – Not a critical area of concern at present.
- After-sales service – This is an important area of revenue generation for Arkaig. However, certain directors are worried about over-focusing on this activity.

Secondary activities:

- Procurement – Not a critical area of concern at present.
- Technology development – Not a critical area of concern at present.
- Human resource management – Arkaig aims to recruit, retain and motivate staff who can fit with its entrepreneurial culture.
- Firm infrastructure (planning, finance, quality control, legal matters) – Not a critical area of concern at present.

Note: The areas noted as not critical do not require comment.

Section B – BOTH questions are compulsory and MUST be attempted

2 Company information

Veyatie is a fashion clothing retailer which caters for both male and female customers of all adult age groups. Veyatie has 10 retail stores. The company's information systems are basic for a business of its size and focus solely on financial information.

Veyatie's strategic objectives are 'To maximise shareholder wealth by increasing the number of retail stores, making our customers completely satisfied, ensuring our stores are attractive and offering the widest range of fashion clothing in our market.'

The Veyatie board has seen little need for non-financial performance indicators (NFPIs) so far, preferring instead to focus attention on cost control and working capital management. As a result, all senior managers are appraised against targets for operating profit margin, inventory turnover and the current ratio.

Customer satisfaction

Following a period of poor financial performance, Veyatie began collecting data on one aspect of non-financial performance, customer satisfaction, as the board had been advised that this is a key driver of financial performance.

The data collection began at the start of Quarter 3 20X3 and there is now data available for two complete years (Appendix 1). Veyatie has found it difficult to interpret this qualitative data and also the trends in this data. Some board members question its usefulness and propose reverting back to reporting just the financial indicators which they are used to.

Veyatie collects this data by asking customers to rate their satisfaction with their visit to the store as they are paying for their items. The scores range from 1 (completely dissatisfied) to 5 (completely satisfied). The mean score is the performance indicator reported to the board and the senior managers. Customers are encouraged to leave a score by having their names entered into a quarterly prize draw to win tickets to major football matches, concerts and amusement parks.

Balanced scorecard

A consultant has suggested to the board that the introduction of a balanced scorecard approach may improve business performance, as Veyatie is unlikely to achieve all of its strategic objectives in the near future. The board has already heard what the benefits of the balanced scorecard are, but are sceptical about these.

The board has asked for your advice on the problems of implementing and using the balanced scorecard approach at Veyatie. One aspect of this advice should focus on the selection of suitable performance measures and the consultant has already chosen some performance measures which could be included in a balanced scorecard at Veyatie (Appendix 2). These have been provided to help you illustrate your advice on the problems of using the balanced scorecard.

Note: The board would welcome your advice on how to refine the performance measures as part of your advice on the problems of using and implementing the balanced scorecard, but does not want you to give a detailed evaluation of the advantages and disadvantages of each performance measure, or to suggest completely new measures.

Required:

It is now 1 September 20X5.

- (a) Assess the difficulties in using and interpreting the customer satisfaction data at Veyatie. (10 marks)
 - (b) Advise the board as requested of the problems of implementing and using the balanced scorecard approach at Veyatie. (15 marks)
- (25 marks)**

Appendix 1

Customer satisfaction data

Percentage of customers giving customer satisfaction scores* between 1 and 5

Narrative	Score	20X3		20X4				20X5	
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Completely satisfied	5	5%	5%	50%	5%	5%	0%	5%	45%
Very satisfied	4	10%	5%	0%	14%	15%	5%	20%	1%
Satisfied	3	70%	65%	0%	56%	50%	65%	45%	1%
Somewhat dissatisfied	2	10%	20%	0%	20%	25%	25%	25%	8%
Completely dissatisfied	1	5%	5%	50%	5%	5%	5%	5%	45%
Mean score		3.00	2.85	3.00	2.94	2.90	2.70	2.95	2.93

* Satisfaction scores were collected from a large number of customers when paying for their items.

Appendix 2

Perspective

Financial

Performance measure

Operating profit margin

Inventory turnover

Current ratio

Customer

Customer satisfaction

Market share

Internal business processes

Stock out percentage¹

Learning and innovation

Total employee training days²

Notes:

1. Stock out percentage is the percentage of product lines which are unavailable for sale in each store at the beginning of each trading day.
2. The human resources department already records the total number of employee training days. Employee training covers the three main areas of health and safety training, training in handling customer complaints and training staff to understand the range of products available and how to display them attractively in the store.

3 Company information

Daldorn is a manufacturer of heavy steel items. It is funded by a venture capitalist organisation (VC). Following a period of poor performance, the VC has expressed concern that Daldorn's board members are focusing too much on their own interests, while neglecting to adequately measure and manage company performance in respect of other stakeholder groups.

The company has experienced severe cash flow difficulties due to financial losses made on the sale of several new products. These difficulties have been attributed to poor pricing decisions, which were the responsibility of the board and have resulted in many employees losing their jobs.

Key stakeholder groups

The VC has identified three key stakeholder groups at Daldorn:

The board

The VC is concerned that due to the past losses made on several new products, the board has become too cautious in their attitude towards potential new projects and, in particular, to the pricing of new products. Given the importance of the board to the success of Daldorn, the VC has recently implemented a new bonus scheme. This is an attempt by the VC to revise the board's appetite for risk and encourage them to take more risks, for example, in deciding on the price of new products. Board members will now receive a very large annual performance-related bonus for Daldorn's achievement of challenging targets set on the financial performance measure of return on capital employed (ROCE).

Employees

The manufacturing process at Daldorn does not require employees to have a high level of skill and so most of the manufacturing employees are relatively low skilled. Other employees in other departments have roles which can require specific skills and qualifications. There is a high level of unemployment in the region where Daldorn is based.

Government and regulators

Daldorn operates in a strict regulatory environment. Daldorn has a good record of compliance, but recently its own scientists have discovered high concentrations of a toxic pollutant, which is a waste product from its own manufacturing processes, in the soil near to its factory.

The VC has asked for your advice on whether Daldorn's existing measures shown in Appendix 1 adequately measure the company's performance in managing the concerns of each of these three key stakeholder groups. You may justify the use of alternative measures, but the VC wants only one measure for each stakeholder group and is not concerned about the potential conflict between measures at this stage. As part of this work, the VC expects you to briefly comment on the power and interest of the three stakeholder groups.

Pricing decision

Daldorn is about to launch a new product and needs to determine an appropriate price to charge. The variable cost of each product is uncertain and, hence, there are three possibilities for each demand level. The total contribution of the products at the three possible anticipated levels of demand are shown in Appendix 2.

Investment projects

Two new mutually exclusive manufacturing projects, which are totally unconnected to Daldorn, have become available for the VC to invest in. The VC has undertaken many similar investments before and is an almost entirely risk neutral investor.

Two important exogenous (external) variables affecting the net present value (NPV) of the new projects, A and B, are the worldwide demand for steel products and the level of tariffs applied to the import of a key raw material. The probabilities of these two variables are independent. The VC has estimated the probabilities of there being low, medium or high levels of these two variables in Appendix 3, together with an estimate of the expected NPV for project A for each level of demand and tariff. An analyst has already calculated that the overall expected value of project B is \$1,347 million.

Required:

- Assess the performance measures shown in Appendix 1 in relation to the three key stakeholder groups as required by the VC. (9 marks)
- Evaluate which price the board would choose for the new product based on the board's revised attitude to risk and briefly comment on the drawbacks of the decision rule used. (5 marks)
- Advise the VC which of the two new investment projects it should undertake, including an evaluation of the appropriateness of the numerical technique used. (11 marks)

(25 marks)

Appendix 1

Stakeholder	Measure
Board	Return on capital employed
Employees	Training costs
Government/regulators	No measure specified

Appendix 2

Demand, selling price and variable cost for the new product

Demand*	Unit selling price \$'000	Unit variable cost \$'000	Unit contribution \$'000	Total contribution \$'000
1,200	75	37	38	45,600

1,200	75	40	35	42,000
1,200	75	50	25	30,000
950	95	37	58	55,100
950	95	40	55	52,250
950	95	50	45	42,750
500	140	37	103	51,500
500	140	40	100	50,000
500	140	50	90	45,000

* Total demand for the whole of the product's anticipated two-year life.

Appendix 3

Project A – Expected NPV (\$ million) for each possible demand level and tariff level combination

		Tariff level		
		High	Medium	Low
Demand level	Low	1,200	1,700	1,850
	Medium	1,000	1,500	1,600
	High	900	1,000	1,100

Project A – Joint probabilities for each possible demand level and tariff level combination

			Tariff level		
			High	Medium	Low
			0-20	0-50	0-30
Demand level	Low	0-20	0-04	0-10	0-06
	Medium	0-50	0-10	0-25	0-15
	High	0-30	0-06	0-15	0-09

Notes

- (1) The standard deviation of the outcomes for project A has been correctly calculated to be 103 and the standard deviation of the outcomes for project B has been correctly calculated to be 106.
- (2) An analyst has already calculated that the overall expected value of project B is \$1,347 million.

Answers of Above Question Paper

Strategic Professional – Options, APM
Advanced Performance Management (APM)

September/December 2019 Sample Answers

- 1 To: The CEO of Arkaig Manufacturing (Arkaig)
From: An Accountant
Date: September 20X5
Subject: Performance reporting and management issues at Arkaig

This report evaluates the current performance report used by the board for strategic review. Next, the use of economic value added (EVA™) at Arkaig is illustrated and its use compared to return on capital employed (ROCE). Then, the differences between performance measurement and management at the different levels of the management hierarchy are discussed with reference to Arkaig. Finally, the implications of a value chain analysis for performance management are assessed.

(i) Strategic performance reporting

The current report has a number of strengths and weaknesses. These will be discussed according to whether the report:

- addresses the overall aims of the business;
- contains appropriate information for decision-making; and
- is well-presented.

The primary aim of Arkaig is to maximise shareholder wealth by providing suitable products for its customers. These products should have a number of qualities: be world-class; tailored; use technology innovatively; show improved machine downtime; and reduce energy consumption for customers.

This should be supported by an entrepreneurial culture among the employees.

Overall, the report contains a number of common financial measures but they are only loosely connected to the stated mission. The following problems are noted about how the report measures the achievement of the mission:

1. There is no direct measure of shareholder wealth in the report. The overall measure of performance for shareholders is provided through the absolute profit after tax and ROCE. It usefully benchmarks the net profit margin and ROCE with industry averages. However, these measures are only indirectly linked to value. The suggestion to use EVA™ is, therefore, appropriate for Arkaig.
2. The supporting pillars of the mission are all qualities of the products produced by Arkaig. The report does not measure any of these individually. There is an indirect measure of customer attitude through the revenue growth figure but without competitor comparison or a market share, it is not possible to draw a conclusion about any of the qualities of the products. These elements relating to the products are difficult to measure overall as they are likely to be dependent on each product line individually. For each in turn:
 - (a) The 'world class' nature of the offering could be measured by market share or customer survey responses.
 - (b) The tailored nature of the products could be measured by the cost of individual design for each installation or customer survey responses.
 - (c) Technological innovation could be measured through comparison of features with the competition or alternatively, by number of industry awards won.
 - (d) Machine downtime and energy consumption requires specific testing of each product line.
3. There is no measure of the employee culture although there is a comment that it is being achieved but this lacks evidence.

The report shows the financial performance by sector as well as in total for the business and the provision of some industry averages is useful in benchmarking performance.

For planning purposes, the lack of external information about customers and competitors makes some of the numbers difficult to interpret. For example, there is no indication whether the fall in revenue is due to general economic conditions or specific faults with Arkaig.

For control purposes, there is previous year information given but not sufficient to establish a trend (which requires at least three years of information). There is no indication of whether the business is meeting its budgets through the provision of variances.

In terms of presentation, the report is clear and it avoids overloading the reader with data. It uses terms which would be easily recognisable to those used to reading accounts. It is helpful that a narrative commentary is provided. However, often the commentary does not go beyond restating the figures in the table. It should provide the significant explanations for each of the major changes commented upon. For example, by stating why the ROCE has exceeded the industry average.

The commentary is an appropriate place to handle the less quantitative aspects of performance such as innovation and employee culture but it does not offer anything substantive. For example, it would be helpful to state what mechanisms are in place to emphasise the entrepreneurial culture (such as percentage of employees who own shares and the total proportion of equity owned by staff).

(ii) **Economic value added (EVA™)**

Workings:

	Year ended 30 June 20X5 \$m
Economic value added	
Operating profit	3,175
<i>Add back:</i>	
Amortisation	95
Marketing capitalised	90
Research and development capitalised	705
Depreciation	1,780
<i>Less:</i>	
Tax paid	694
Lost tax relief on interest	53
Economic depreciation	1,907
NOPAT	<u>3,191</u>
Capital employed	
At 20X5 year start	19,404
Research and development asset	3,528
Marketing spend capitalised	900
Marketing written-off	(100)
Adjusted capital employed	<u>23,732</u>

$$\text{WACC} = (55\% \times 12\%) + (45\% \times 3.8\% \times (1 - 25\%)) \\ = 7.88\%$$

$$\text{EVA}^{\text{TM}} = \text{NOPAT} - (\text{WACC} \times \text{capital employed}) \\ = 1,321$$

The business has created \$1.32bn of value in the last year. The net operating profit after tax more than covers the cost of the capital used by the business.

The main benefit to EVA™ is its link to the overall corporate objective of maximising shareholder wealth. ROCE gives a much less direct link to shareholder wealth as it is less cash-like and more tied to the accounting assumptions around producing a profit figure.

The basic test of performance is simple since for EVA™ if it is positive, then the business is generating a return above that required by the providers of finance. ROCE requires a target level to be set usually based on benchmarking to the industry sector and the setting of this target return can be somewhat subjective.

EVA™ encourages investment for the future (for example, in advertising and development) by removing such costs from the performance period and treating them like capital expenditure. This will reduce the dysfunctional temptation for management to engage in some short-term decision-making, which can be a problem with the unadjusted capital employed figure from the financial statements which is used in ROCE. This is particularly relevant to Arkaig, where research and development is a significant activity.

EVA™ is consistent with net present value (NPV) as businesses with an increasing present value will increase EVA™. This will aid communication as NPV is a widely used appraisal measure for businesses.

Overall, however, the better link to shareholder wealth creation and the use of EVA™ in a value-based management framework may make this extra complexity worthwhile for a large entity such as Arkaig.

(iii) **Performance hierarchy**

According to Anthony, there are three tiers to decision-making in an organisation and each one has different needs which impact on the performance information which is required.

The strategic level is the one associated with the higher levels of management (such as the board). Strategic performance is measured over longer periods (3–10 years) since this depends on the achievement of the strategies which will enable the achievement of the overall mission of the business. The information will be externally focused requiring information on competitors and markets against which the company's performance can be benchmarked. This information will be used mainly for planning rather than controlling. At this level of the hierarchy, forecasts will be prepared and broad targets will be set for the lower levels of management and their performance measured against these targets. Therefore, information will often be heavily aggregated and qualitative in nature (such as customer attitudes). The board report evaluated above is an illustration of this type of information.

At the tactical level, the middle layer of management will be concerned with shorter term and more detailed objectives (possibly over a quarter or year) than the strategic level. The information will be collected on the deployment of the company's resources

and activities on a functional department or business unit level. This information will be used to see that the strategic objectives are being supported by the company's activities. It will contain information to aid some short-term planning but will focus more on assisting this layer of management to control the operations of the business. Much of the information at this level will be internally generated and will be combined with the targets supplied by the strategic level in order to make decisions. For example, generally, the achievement of budget targets or more specifically, the sales and marketing department might be required to report quarterly on changes in the order book in order that the strategic level can forecast future revenue levels.

The operational level focuses on the day-to-day activities of the business ensuring that specific tasks set by the tactical level are achieved. Therefore, information at this level is detailed and task-specific. It will be prepared on a regular basis (often daily or weekly). It will be aimed to assist management at this level in controlling the business in order to achieve its short-term plans (weekly sales or monthly profit targets). There will be little external information needed at this level as there is very little planning activity being carried out.

(iv) Value chain

The value chain is a model of business integration showing the way that business activities are organised and linked. This model uses activities rather than traditional functional departments (such as finance) to describe the business, emphasising that it is activities which create value and incur costs. The activities are split into two groups: primary ones which the customer interacts with directly and can 'see' the value being created and secondary ones which support the primary activities. The business can then identify how value is created and so focus on improving this through its performance measurement system (for example, the board report).

Another important feature of the value chain is the idea of value creation through a chain linking activities to each other. Therefore, there must be a flow of information between the different activities and across departmental boundaries. In performance management terms, this will affect the information systems which will have to ensure good communication across functional boundaries and also, the job descriptions and reporting hierarchies, as these will have to reflect activities rather than being purely contained within functional areas.

This chain will not stop at the organisation's boundaries as can be seen at Arkaig, where the relationship with suppliers (inbound logistics and procurement) is identified as an area of concern.

A specific area of concern at Arkaig is inbound and outbound logistics where there is an old warehousing and distribution information system. For a business such as Arkaig which aims to use technology innovatively, this could lead to inefficiencies. A state-of-the-art system would be integrated with the production and sales systems and would allow better stock control with fewer errors in picking inventory and reduced obsolescence while improved distribution could lead to faster delivery to customers with reduced costs of transportation.

The concern regarding after-sales service may be due to an inconsistency in having an area which generates a significant amount of revenue but which relates in reality to the failure of reliability of the business' products. It would be important to identify that customers' attitude to product reliability is not affected and that they see this service as necessary (maybe by benchmarking failure rates/machine downtime against competitors).

Although the chain shows human resources as a secondary activity, it is recognised as important to achieving the entrepreneurial culture at Arkaig. This culture can be realised through the reward system where employees are rewarded by share ownership or a share option scheme. Its effect can be measured through improved profitability and increased innovation.

2 (a) Subjectivity

Customers' own assessments of satisfaction are subjective. Different customers could buy the same goods in the same store and at the same time, but still score their satisfaction differently. Different customers may have different expectations of their visit to the store and will attach different levels of importance to different aspects of their visit. Some may place a high importance on being able to move around the store and access goods easily, whereas to others this may be unimportant and would not affect their satisfaction.

Another reason why the data may be misleading is that, when rating their satisfaction, customers may tend to use the middle scores and be reluctant to use the highest and lowest scores. This appears to be the case in the data given where in most quarters customers do not give the scores of 1 or 5.

Aggregated and mean data

The collection of data of a single measure of customer satisfaction does not indicate what aspect of their visit to the store customers are satisfied, or dissatisfied, with. Customers may consider the price, design and quality of the goods, the comfort and layout of the store or the friendliness and product knowledge of the staff when scoring their satisfaction. Without knowing which aspects of their visit customers are satisfied with, it will be hard to know what to do to improve customer satisfaction.

Using the mean score may also make the data hard to interpret. For example, in Quarter 1 20X4, 50% of the customers are completely satisfied (a score of 5) and 50% of the customer are completely dissatisfied (a score of 1). This may be due to an error in collecting or compiling the data, but the mean score of 3 indicates that, overall, customers are satisfied, whereas 50% of them are completely dissatisfied. The calculation of the median or modal score may be preferable because this reduces the distortion to mean scores caused by very high or low scores.

Incomplete data

The data may not represent the views of a wide range of customers. The scores are collected when customers are buying goods at the till. This does not reflect the views of the customers who were so dissatisfied that they did not buy anything.

The prizes offered in the draw to encourage customers to leave the satisfaction score may appeal differently to male and female customers and to customers of different ages. For example, tickets to amusement parks may appeal more to younger customers than to older ones. Using this data as if it represents a wide range of customers' views may be misleading and lead to incorrect decisions being taken.

Identifying trends

Identifying trends is one way of overcoming some of the problems of interpreting the customer data, but it may be difficult to identify trends. In a fashion retailer such as Veyatie, there may be seasonal and short-term or cyclical trends, which make it hard to interpret what the long-term trend is.

In the limited data given, there appears to be a seasonal trend where customer satisfaction is worse in Quarter 4 than in any other quarter in each year. Overall there seems to be a downward trend, with every quarter being worse than the same quarter in the previous year.

(b) Problems of implementing and using the balanced scorecard

Selecting measures

Veyatie's strategic objectives are to maximise shareholder wealth by increasing the number of retail stores, making customers completely satisfied, ensuring its stores are attractive and offering the widest range of fashion clothing in the market. Measures must be selected which are congruent with Veyatie's critical success factors (CSFs) and strategic objectives. Though it is unclear what the CSFs are, at least one of the strategic objectives, to increase the number of stores, is not reflected at all in the measures selected. The lack of a suitable measure for this objective could be the reason why Veyatie is unlikely to open new stores in the near future.

Measures must not be selected just because they are easy to measure. The human resources department already records the total number of employee training days, so this measure could have been selected just because the data is readily available.

The number of days spent on the different types of training is unclear. Though clearly important, staff health and safety training does not directly help Veyatie achieve its strategic objectives. It may simply reflect Veyatie's legal obligations and so would not help gain competitive advantage. It would be better to measure the days spent training staff to understand the range of products available and how to display them attractively in the store, as this directly relates to Veyatie's strategic objectives.

One of the benefits of the balanced scorecard approach is that it presents a holistic view of a business, covering financial and non-financial and internal and external factors. The measures selected do cover all four perspectives of the balanced scorecard, but do not seem to be well balanced as there are more measures in the financial perspective than in each of the other perspectives. Also, most of the measures are internally focused.

The bias towards financial measures may reflect the fact that the board has so far seen little need for non-financial indicators. Financial measures, however, are backwards looking and measure the results of actions taken in the past. It is non-financial factors, such as customer satisfaction, which drive future performance and which will enable Veyatie to achieve its strategic objectives.

Conflicting measures

When selecting measures to use in the balanced scorecard, care must be taken to select measures which do not conflict with each other. Otherwise, without further guidance, managers will not know which measure to focus on, or may simply ignore one measure and focus on another.

Several of the measures selected by the consultant may potentially conflict with one another. For example, in order to achieve a low stock out percentage, Veyatie may have to hold higher levels of inventory which may worsen inventory turnover. This could apply at the overall company level or at individual stores.

The financial measure of operating profit margins conflicts with some of the measures in the other perspectives. The total number of employee training days has been selected to measure the learning and innovation perspective. The cost of this training, at least in the short term, will reduce operating profit margins. Similarly, having a high market share may imply that Veyatie will have to be competitive on price, which will also lower operating profit margins.

Board commitment

If the introduction of the balanced scorecard approach is to be successful, the commitment of the board is essential. Without this, other managers in the business are unlikely to work hard to implement and use the approach.

The board is already sceptical about the benefits of the balanced scorecard. There is the danger that it may simply be abandoned if it is found difficult to use, as was proposed for the collection of customer satisfaction data which was found to be difficult to interpret. The board's apparent disregard of non-financial performance measures is also clearly inconsistent with a successful introduction of the balanced scorecard approach.

Collecting and interpreting data

Interpreting the measures used in the balanced scorecard may be difficult, for example, for qualitative data such as customer satisfaction, which Veyatie has already had difficulties in interpreting. A lack of expertise in interpreting this data, may lead to wrong decisions being made.

The collection and interpretation of the data for the balanced scorecard will take time and resources. There may be staff resistance to the change, though this may be overcome by training in the benefits and use of the balanced scorecard.

Veyatie's information systems are basic for a business of its size and focus just on the use of financial information. They will need to be replaced or upgraded in order to collect and process non-financial and external data required for the balanced scorecard. The cost of implementing and using the balanced scorecard should be compared to the benefits of doing so.

3 (a) Board

The board members are key players who have a high level of power and interest. It is important that they understand and approve of Daldorn's strategy. It is vital that they are kept motivated in order to drive Daldorn's performance. The VC has recently implemented a new reward system, where the board will receive a very large annual performance-related bonus for the achievement of targets on return on capital employed (ROCE).

ROCE may be an appropriate measure as it will be familiar to the board. It does have some drawbacks as a performance measure, for example, by discouraging investment in new assets. Alternative measures such as economic value added (EVA™) may overcome some of these drawbacks.

Employees

Employees have a high interest as they depend on the company for their income in an area of high unemployment. Most employees are relatively unskilled, and individually have low power, as they could be easily replaced. As Daldorn operates in a strict regulatory environment, employees' rights are likely to be legally protected which may increase their power.

Employees should be kept informed to prevent them joining forces with more powerful stakeholder groups, such as the regulators or trades unions. Training costs are probably not a suitable measure for the mostly low-skilled workforce, as the manufacturing process does not require a high level of skill. Measures relating to employee productivity may be more useful, because, for example, higher productivity may increase their job security.

Some employees' roles are more highly skilled and, for them, training costs will be a suitable measure of how well their skills are increased or maintained. The cost of training may not, however, indicate whether the training is appropriate or effective. A more precise measure, such as the percentage of employees achieving a particular relevant qualification or skill level, may be more appropriate.

Government and regulators

There are currently no measures relating to the government and regulators. As Daldorn operates in a strict regulatory environment, this seems inappropriate as breaches in regulations could lead to fines or loss of reputation.

The government and regulators have a high level of power but low interest. To prevent them becoming key players, they should be kept satisfied. This could be done by introducing measures relating to environmental performance, such as the level of toxic pollutants in the soil close to Daldorn's factory. This would allow Daldorn to take action to reduce the level of pollutants if these approached levels likely to breach environmental regulations.

- (b) The board now has very large performance-related bonuses. This will mean that they have a risk seeking attitude to risk, in order to maximise their bonuses. The board would use the 'maximax' decision rule, that is, they would choose the price which maximises the maximum contribution. This price is \$95,000 which would give a maximum contribution of \$55,100,000.

The main drawback of using the maximax decision rule is that it may encourage the board to take excessive risks, as opposed to their previous attitude which was too cautious. The maximax rule also does not take into account the probabilities of each outcome and these probabilities are difficult to determine.

- (c) The VC is an almost entirely risk neutral investor. The expected value (EV) approach is appropriate as they will accept the project with the highest expected NPV.

A problem with the EV approach is that it is a long run average which assumes a decision is repeated many times and is inappropriate for one-off decisions. The EV is unlikely to be the actual outcome of the project.

The VC has undertaken many similar projects and, hence, it would be appropriate to use EV. The estimations of the probabilities and the cost of capital are subjective and could be inaccurate. This would limit the effectiveness of the EV approach. The VC is experienced in estimating these probabilities, which would make the results of the calculation more reliable. The EV calculations for the two projects only consider two important exogenous variables. In practice, there are many different internal and external factors which could affect the NPV of the projects.

The calculations indicate that both projects have the same NPV of \$1,347 million (W1). As a risk neutral investor, the VC would be indifferent to which project to undertake.

The outcomes of project A have a slightly lower standard deviation (103) than those of project B (106). The spread of possible outcomes is therefore greater for project B, which means that it is riskier. The VC may therefore choose project A. Given that the NPV of the two projects are the same, further work such as sensitivity analysis, or an analysis of the external environment (PEST), could be done to help the VC make their choice.

W1 – Expected NPV of Project A*

		Tariff			Total
		High	Med	Low	
Demand	Low	48 (1,200 x 0.04)	170 (1,700 x 0.10)	111 (1,850 x 0.06)	329
	Med	100 (1,000 x 0.10)	375 (1,500 x 0.25)	240 (1,600 x 0.15)	715
	High	54 (900 x 0.06)	150 (1,000 x 0.15)	99 (1,100 x 0.09)	303
	Total	<u>202</u>	<u>695</u>	<u>450</u>	<u>1,347</u>

*Assuming the probabilities of the two variables are independent.