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# Answers

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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

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

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

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 EVA™ 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 to 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.

- 1 (i)** Economic value added  
 Calculation:  
 1 mark for each of:  
     Research and development  
     Depreciation on leased assets  
     Tax paid  
     Capital employed year start figure  
     Non-cash expenses  
     Research and development  
     WACC  
     Economic value added  
 Maximum 8 marks
- Assumptions and corrections  
 1 mark per point  
 Maximum of 8 marks  
 Maximum 15 marks
- (ii)** KPIs for CSFs  
 Up to 2 marks per CSF  
 Maximum 6 marks
- (iii)** Quality projects  
 Definitions and descriptions up to 2 marks  
 Analysis up to 6 marks per project  
 Maximum 15 marks
- (iv)** New unified database  
 Definition and general points up to 3 marks  
 Interaction with each project up to 3 marks each  
 Other comments up to 3 marks  
 Maximum 10 marks
- Professional presentation: up to 4 marks

**Total 50 marks**

- |              |                              |    |
|--------------|------------------------------|----|
| <b>2 (a)</b> | Weaknesses in current system | 10 |
|              | Environment                  | 5  |
|              | Conclusion                   | 1  |
|              | Maximum 13 marks             |    |
| <b>(b)</b>   | Beyond budgeting             |    |
|              | General description          |    |
|              | 1 mark per point up to       | 4  |
|              | Application and impact       | 10 |
|              | Maximum 12 marks             |    |

**Total 25 marks**

<b>3 (a)</b>	Use of DMAIC	
	Define	
	1 mark per point up to	4
	Measure	
	1 mark per point up to	6
	Analyse	3
	Improve	3
	Control	3

Maximum 15 marks

<b>(b) (i)</b>	Definition	1
	Impact on information requirements	
	1 mark per point up to	6
	Maximum 6 marks	
<b>(ii)</b>	Impact on information requirements	
	1 mark per point up to	4
	Maximum 4 marks	

**Total 25 marks**

- 4 (a)** 1 mark per relevant point  
 No marks for a list of new measures without justifying why they would benefit Soup  
 1 mark only for a generic description of the balanced scorecard without clear references to the scenario  
 Maximum 10 marks
- (b)** Calculation  
 1 mark each for:  
 Seats available per train  
 Seats available per day by region/time  
 Seat occupancy by region/time  
 Total seat occupancy  
 Comment on whether consistent with governments claims about overcrowding – 1 mark  
 Other comments – 2 marks  
 Up to 2 additional marks for identifying journey time is an important factor and for attempting to quantify journey times from the data given  
 Maximum 7 marks
- (c)** Maximum of 3 marks if general points not applied to Soup  
 Selection of appropriate measures – up to 2 marks  
 Prioritisation of measures – up to 2 marks  
 Difficulties of making measurements – up to 2 marks  
 Conflicting measures – up to 2 marks  
 Overload of measures – up to 2 marks  
 Maximum 8 marks

**Total 25 marks**