Lecture 4: Exercises

22.11 Balanced scorecard (Adopted by Horngren, C.T., Bhimani, A., Datar, S.M. and Foster, G. (2012). Management and cost accounting. Prentice Hall, 5th eds.)

La Quinta Ltd manufactures corrugated cardboard boxes. It competes and plans to grow by producing high-quality boxes at a low cost that are delivered to customers in a timely manner. There are many other manufacturers who produce similar boxes. La Quinta believes that continuously improving its manufacturing processes and having satisfied employees are critical to implementing its strategy in 2005.

Required:

1. Is La Quinta's 2005 strategy one of product differentiation or cost leadership? Explain briefly.
2. Indicate two measures you would expect to see under each perspective in La Quinta's balanced scorecard for 2005. Explain your answer briefly.

Suggested Solution

1.
La Quinta's 2005 strategy is a cost leadership strategy. La Quinta plans to grow by producing high-quality boxes at a low cost delivered to customers in a timely manner. La Quinta's boxes are not differentiated and there are many other manufacturers who produce similar boxes. To succeed, La Quinta must achieve lower costs relative to competitors through productivity and efficiency improvements.

2.
Measures that we would expect to see on a La Quinta's balanced scorecard for 2005 are:
Financial perspective
- Operating income from productivity gain
- Operating income from growth
- Cost reductions in key areas.

These measures evaluate whether La Quinta has successfully reduced costs and generated growth through cost leadership.
Customer perspective
- Market share
- New customers
- Customer satisfaction index
- Customer retention
- Time taken to fulfil customer orders.

The logic is that improvements in these customer measures are leading indicators of superior financial performance.
Internal business process perspective

- Yield
- Productivity
- Order delivery time
- On-time delivery.

Improvements in these measures are expected to lead to more satisfied customers and in turn to superior financial performance.

Learning and growth perspective

- Percentage of employees trained in process and quality management
- Employee satisfaction
- Number of major process improvements.

Improvements in these measures have a cause-and-effect relationship with improvements in internal business processes, which in turn lead to improved customer satisfaction and financial performance.

22.12 Strategy, balanced scorecard (Adopted by Horngren, C.T., Bhimani, A., Datar, S.M. and Foster, G. (2012). Management and cost accounting. Prentice Hall, 5th eds.)

Meredith Ltd makes a special-purpose machine D4H used in the textile industry. Meredith has designed the D4H machine for 2005 to be distinct from its competitors. It has been generally regarded as a superior machine. Meredith presents the following data for the years 2004 and 2005.

		2004	**2005**
1.	Units of D4H produced and sold	200	210
2.	Selling price	£40 000	£42 000
3.	Direct materials (kilograms)	300 000	310 000
4.	Direct materials cost per kilogram	£8	£8.50
5.	Manufacturing capacity in units of D4H	250	250
6.	Total conversion costs	£2 000 000	£2 025 000
7.	Conversion costs per unit of capacity	£8 000	£8 100
8.	Selling and customer-service capacity	100 customers	95 customers
9.	Total selling and customer-service costs	£1 000 000	£ 940 500
10.	Selling and customer-service capacity cost per customer	£10 000	£9 900
11.	Design staff	12	12
12.	Total design costs	£1 200 000	£1 212 000
13.	Design costs per employee	£100 000	£101 000

Meredith produces no defective machines, but it wants to reduce direct materials usage per D4H machine in 2005. Conversion costs in each year depend on production capacity defined in terms of D4H units that can be produced, not the actual units of D4H produced. Selling and customer-service costs depend on the number of customers that Meredith can support, not the actual number of customers Meredith serves. Meredith has 75 customers in 2004 and 80 customers in 2005. At the start of each year, management uses its discretion to determine the number of design staff for the year. The design staff and costs have no direct relationship with the quantity of D4H produced or the number of customers to whom D4H is sold.

Required:

1. Is Meredith's strategy one of product differentiation or cost leadership? Explain briefly.
2. Describe briefly key elements that you would include in Meredith's balanced scorecard and the reasons for doing so.

Suggested Solution

1.
Meredith Ltd follows a product differentiation strategy in 2012. Meredith's D4H machine is distinct from its competitors and generally regarded as superior to competitors' products. To succeed, Meredith must continue to differentiate its product and charge a premium price.

2.
Balanced Scorecard measures for 2012 are as follows:
Financial perspective
(1) Increase in operating income from charging higher margins, (2) price premium earned on products.
These measures indicate whether Meredith has been able to charge premium prices and achieve operating income increases through product differentiation.
Customer perspective
(1) Market share in high-end special-purpose textile machines, (2) customer satisfaction, (3) new customers.
Improvements in these customer measures are leading indicators of superior financial performance.
Internal business process perspective
(1) Manufacturing quality, (2) new product features added, (3) order delivery time.
Improvements in these measures are expected to result in more satisfied customers and, in turn, superior financial performance.
Learning and growth perspective
(1) Development time for designing new machines, (2) improvements in manufacturing processes, (3) employee education and skill levels, (4) employee satisfaction.
Improvements in these measures have a cause-and-effect relationship with improvements in internal business processes, which in turn lead to customer satisfaction and financial performance.

22.13 Strategy, balanced scorecard, service company (Adopted by Horngren, C.T., Bhimani, A., Datar, S.M. and Foster, G. (2012). Management and cost accounting. Prentice Hall, 5th eds.)

Snyder & Partners is a small information systems consulting firm that specialises in helping companies implement sales management software. The market for Snyder's products is very competitive. To compete, Snyder must deliver quality service at a low cost. Snyder Invoices clients in terms of units of work performed, which depends on the size and compacity of the sales management system. Snyder presents the following data for the years 2004 and 2005.

		2004	2005
1.	Units of work performed	60	70
2.	Selling price	£50 000	£48 000
3.	Software implementation labour-hours	30 000	32 000
4.	Cost per software implementation labour-hour	£60	£63
5.	Software implementation support capacity (in units of work)	90	90
6.	Total cost of software implementation support	£360 000	£369 000
7.	Software implementation support capacity cost per unit of work	£4 000	£4 100
8.	Number of employees doing software development	3	3
9.	Total software development costs	£375 000	£390 000
10.	Software development costs per employee	£125 000	£130 000

Software implementation labour-hour costs are variable costs. Software implementation support costs for each year depend on the software implementation support capacity (defined in terms of units of work) that Snyder chooses to maintain each year. It does not vary with the actual units of work performed that year. At the start of each year, management uses its discretion to determine the number of software development employees. The software development staff and costs have no direct relationship with the number of units of work performed.

Required:

1. Is Snyder's strategy one of product differentiation or cost leadership? Explain briefly.
2. Describe briefly key elements that you would include in Snyder's balanced scorecard and your reasons for doing so.

Suggested Solution

1 Snyder's strategy in 2005 is cost leadership. Snyder's consulting services for implementing sales management software are not distinct from those of its competitors. The market for these services is very competitive. To succeed, Snyder must deliver quality service at low cost. Improving productivity while maintaining quality is key.

2 Balanced scorecard measures for 2005 follow:

Financial perspective

- Increase operating income from productivity gains and growth
- Revenues per employee
- Cost reductions in key areas, for example software implementation and overhead costs.

These measures indicate whether Snyder has been able to reduce costs and achieve operating income increases through cost leadership.

Customer perspective

- Market share
- New customers
- Customer responsiveness
- Customer satisfaction.

Improvements in these customer measures are regarded as leading indicators of superior financial performance.

Internal business process perspective

- Time to complete customer jobs
- Time lost due to errors
- Quality of job. (Is system running smoothly after job is completed?)

Improvements in these measures are expected to lead to more satisfied customers, lower costs and superior financial performance.

Learning and growth perspective

- Time required to analyse and design implementation steps
- Time taken to perform key steps implementing the software
- Skill levels of employees
- Hours of employee training
- Employee satisfaction and motivation.

Improvements in these measures have a cause-and-effect relationship with improvements in internal business processes, leading to improved customer satisfaction and financial performance.

22.14 Balanced scorecard. [R. Kaplan, adapted] (Adopted by Horngren, C.T., Bhimani, A., Datar, S.M. and Foster, G. (2012). Management and cost accounting. Prentice Hall, 5th eds.)

Caltex GmbH refines petrol and sells it through its own Caltex petrol stations. On the basis of market research, Caltex determines that 60% of the overall petrol market consists of 'service-oriented customers', medium- to high-income individuals who are willing to pay a higher price for petrol if the petrol stations can provide excellent customer service such as a clean facility, a convenience store, friendly employees, a quick turnround, the ability to pay by credit card, and high-octane premium fuel. The remaining 40% of the overall market are 'price shoppers' who look to buy the cheapest petrol available. Caltex's strategy is to focus on the 60% of service-oriented customers. Caltex's balanced scorecard for the year 2005 is given below. For brevity, the initiatives taken under each objective are omitted.

Objectives	Measures	Target performance	Actual performance
Financial perspective			
Increase shareholder value	Operating profit changes from price recovery	€90 000 000	€95 000 000
	Operating profit changes from growth	€65 000 000	€67 000 000
Customer perspective			
Increase market share	Market share of overall petrol market	10%	9.8%
Internal business process perspective			
Improve petrol quality	Quality index	94 points	95 points
Improve refinery performance	Refinery reliability index (%)	91%	91%
Ensure petrol availability	Product availability index (%)	99%	100%
Learning and growth perspective			
Increase refinery process capability	Percentage of refinery processes with advanced controls	88%	90%

Required:

1. Was Caltex successful in implementing its strategy in 2005? Explain your answer.
2. Would you have included some measure of employee satisfaction and employee training in the learning and growth perspective? Are these objectives critical to Caltex for implementing its strategy? Why or why not? Explain briefly.
3. Explain how Caltex did not achieve its target market share in the total petrol market but still exceeded its financial targets. Is 'market share of overall petrol market' the correct measure of market share? Explain briefly.
4. Is there a cause-and-effect linkage between improvements in the measures in the internal business process perspective and the measures in the customer perspective? That is, would you add other measures to the internal business process perspective or the customer perspective? Why or why not? Explain briefly.
5. Do you agree with Caltex's decision not to include measures of changes in operating profit from productivity improvements under the financial perspective of the balanced scorecard? Explain briefly.

Suggested Solution

1.

Caltex's strategy is to focus on 'service-oriented customers' who are willing to pay a higher price for services. Even though its product is largely a commodity product, petrol, Caltex wants to differentiate itself through the service it provides at its retailing stations.

Does the scorecard represent Caltex's strategy? By and large it does. The focus of the scorecard is on measures of process improvement, quality, market share, and financial success from product differentiation. There are some deficiencies that the subsequent assignment exercises raise but, abstracting from these concerns for the moment, the scorecard does focus on implementing a product differentiation strategy.

Having concluded that the scorecard has been reasonably well designed, how has Caltex performed relative to its strategy in 2005? It appears from the scorecard that Caltex was successful in implementing its strategy in 2005. It achieved all targets in the financial, internal business, and learning and growth perspectives. The only target it missed was the market share target in the customer perspective. At this stage, students may raise some questions about whether this is a good scorecard measure. Requirement 3 gets at this issue in more detail. The bottom line is that measuring 'market share in the overall petrol market' rather than in the 'service-oriented customer' market segment is not a good scorecard measure, so not achieving this target may not be as big an issue as it may at first seem.

2.

Yes, Caltex should include some measure of employee satisfaction and employee training in the learning and growth perspective. Caltex's differentiation strategy and ability to charge a premium price is based on customer service. The key to good, fast and friendly customer service is well-trained and satisfied employees. Untrained and dissatisfied employees will have poor interactions with customers and cause the strategy to fail. Hence, training and employee satisfaction are important to Caltex for implementing its strategy. These measures are leading indicators of whether Caltex will be able to successfully implement its strategy and, hence, should be measured on the balanced scorecard.

3.
Caltex's strategy is to focus on the 60% of petrol consumers who are service-oriented, not on the 40% price-shopper segment. To evaluate if it has been successful in implementing its strategy, Caltex needs to measure its market share in its targeted market segment, 'service-oriented customers', not its market share in the overall market. Given Caltex's strategy, it should not be concerned if its market share in the price-shopper segment declines. In fact, charging premium prices will probably cause its market share in this segment to decline. Caltex should replace 'market share in overall petrol market' with 'market share in the service-oriented customer segment' in its balanced scorecard customer measure. Caltex may also want to consider putting a customer satisfaction measure on the scorecard. This measure should capture an overall evaluation of customer reactions to the facility, the convenience store, employee interactions and quick turnround. The customer satisfaction measure would serve as a leading indicator of market share in the service-oriented customer segment.
4.
Although there is a cause-and-effect link between internal business process measures and customer measures on the current scorecard, Caltex should add more measures to tighten this linkage. In particular, the current scorecard measures focus exclusively on refinery operations and not on petrol station operations. Caltex should add measures of petrol station performance such as cleanliness of the facility, turnround time at the pumps, the shopping experience at the convenience store, and the service provided by employees. Many companies do random audits of their facilities to evaluate how well their branches and retail outlets are performing. These measures would serve as leading indicators of customer satisfaction and market share in Caltex's targeted segments.
5.
Caltex is correct in not measuring changes in operating profit from productivity improvements on its scorecard under the financial perspective. Caltex's strategy is to grow by charging premium prices for customer service. The scorecard measures focus on Caltex's success in implementing this strategy. Productivity gains *per se* are not critical to Caltex's strategy and, hence, should not be measured on the scorecard.

21.16 (Adopted by Drury, C. (2012). Management and cost accounting. Cengage Learning Hall, 8th eds.)

CAL manufactures and sells solar panels for garden lights. Components are bought in and assembled into metal frames that are machine manufactured by CAL. There are a number of alternative suppliers of these solar panels. Some of CAL’s competitors charge a lower price, but supply lower quality panels; whereas others supply higher quality panels than CAL but for a much higher price. CAL is preparing its budgets for the coming year and has estimated that the market demand for its type of solar panels will be 100 000 units and that its share will be 20 000 units (i.e. 20 per cent of the available market). The standard cost details of each solar panel are as follows:

		$ per unit
Selling price		60
Bought-in components (1 set)	15	
Assembly & machining cost	25	
Delivery cost	5	45

Contribution		15

An analysis of CAL's recent performance revealed that 2 per cent of the solar panels supplied to customers were returned for free replacement, because the customer found that they were faulty. Investigation of these returned items shows that the components had been damaged when they had been assembled into the metal frame. These returned panels cannot be repaired and have no scrap value. If the supply of faulty solar panels to customers could be eliminated then, due to improved customer perception, CAL's market share would increase to 25 per cent.

Required:

1. Explain, with reference to CAL, quality conformance costs and quality non-conformance costs and the relationship between them.
2. Assuming that CAL continues with its present systems and that the percentage of quality failings is as stated above: (i) Calculate, based on the budgeted figures and sales returns rate, the total relevant costs of quality for the coming year. (ii) Calculate the maximum saving that could be made by implementing an inspection process for the solar panels, immediately before the goods are delivered.

Suggested Solution

1.

Prevention and appraisal costs are sometimes referred to as the costs of quality conformance or compliance and internal and external failure costs are also known as the costs of non-conformance or non-compliance. Costs of compliance are incurred with the intention of eliminating the costs of failure. They are discretionary in the sense that they do not have to be incurred, whereas costs of non-compliance are the result of production imperfections and can only be reduced by increasing compliance expenditure. The different cost categories are related to the extent that the more that is spent on conformance costs the lower should be the level of quality failures and therefore the lower the nonconformance costs. Organizations must decide on the quality/cost trade off but many organizations are now seeking to implement a zero-defect policy. The question suggests that CAL has positioned itself in the middle of the range of possible quality/cost trade offs because some of its competitors supply lower quality products whereas others supply high quality products.

2.

(i) Since customer demand is 20 000 good items and 2% of the items supplied are faulty the total number of items to be supplied is 20 408 (20 000 x 100/98) so that 408 are returned for free replacement. The cost of these 408 units that are replaced free of charge is $18 360 (408 x $45). If failures can be eliminated the market share would increase to 25 per cent and this would result in an additional contribution of $75 000 (5 000 x $15). Therefore the cost of non-conformance is $93 360.

(ii) The inspection process will not avoid internal failures but the lost sales and the delivery cost will be avoided. Thus the cost of internal failure could potentially be reduced to $16 320 (408 units $40) giving a saving of $77 040 ($93 360 – $16 320). The introduction of the inspection process should also provide speedy feedback on internal failures which should result in action taken to reduce future failures.

21.22 (Adopted by Drury, C. (2012). Management and cost accounting. Cengage Learning Hall, 8th eds.)

HT manufactures and sells consumer goods. The market in which it operates is highly competitive and HT is constantly designing new products in order to maintain its market share. The life cycle of products in the market is extremely short with all of the manufacturers constantly introducing new products or variations on existing products. Consumers consider two main factors when buying these products: price and quality. HT uses a penetration pricing policy when launching its products and is always striving to improve its quality from product design stage through to customer care. As a result it has a 15 per cent market share, and its largest competitor has a 6 per cent market share with around 30 other companies sharing the remainder of the market.

Required:

1. Discuss the relationship between quality conformance costs and product selling prices in HT.

Suggested Solution

1.

HT is operating in a market where consumers consider price and quality to be the main factors influencing their buying decisions. This raises the question – to what extent are customers prepared to pay for higher quality (i.e. there is a trade-off between price and quality). Increasing product quality results in higher costs but this may be reflected in HT being able to charge higher prices. HT needs to decide whether to follow a low price, low quality strategy or a high price, high quality strategy, or to follow a strategy that lies somewhere between these two extremes.